

## **CLARK COUNTY MONITORING SYSTEM**

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### **ABSTRACT**

Since 1988, Clark County has been one of the counties designated by the DOE as an “Affected Unit of Local Government” (AULG). The AULG designation is an acknowledgement by the federal government that activities associated with the Yucca Mountain proposal could result in considerable impacts on Clark County residents and the community as a whole. As an AULG, Clark County is authorized to identify “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 provisions of the Nuclear Waste Policy Amendments Act (NWPAA), Clark County.

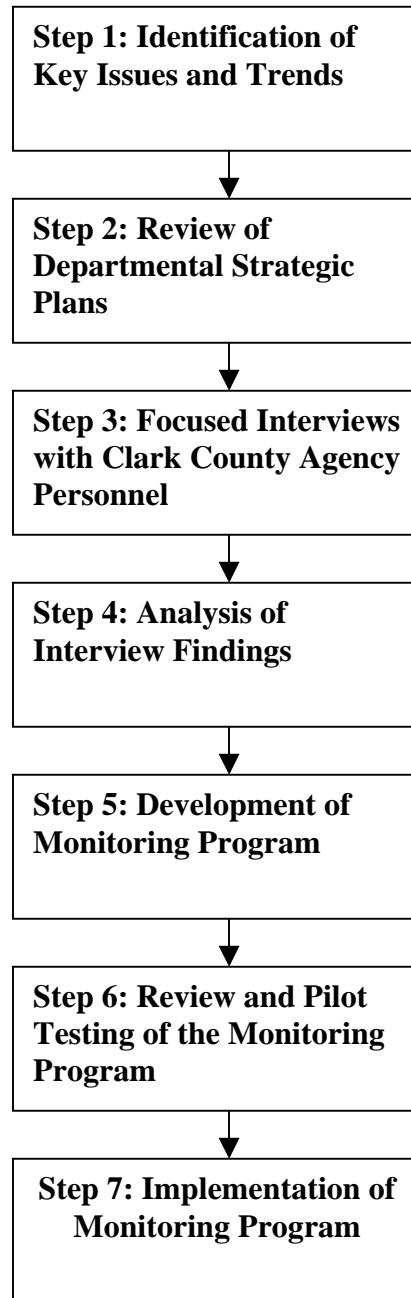
Towards this end, Clark County has conducted numerous studies of potential impacts, many of which are summarized in Clark County’s Impact Assessment Report that was submitted to DOE and the President of the United States in February 2002. Given the unprecedented magnitude and duration of DOE’s proposal, as well as the many unanswered questions about the number of shipments and the modal mix, the estimate of impacts described in these studies are preliminary. In order to refine these estimates, Clark County Comprehensive Planning Department’s Nuclear Waste Division is continuing to assess potential impacts. In addition, the County has implemented a Monitoring Program designed to 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 acts as an “*early warning system*” that allows Clark County decision makers to proactively respond to impacts from the Yucca Mountain Project.

### **INTRODUCTION**

Because of the dynamic nature of the Yucca Mountain Project, it is expected that the nature and timing of impacts to Clark County agencies will vary over the duration of the program. For example, the Clark County Fire Department has already spent considerable time in planning, training, and estimating impacts. Other Clark County agencies likely will not experience any impacts prior to commencement of the High-Level Nuclear Waste (HLNW) shipment campaign. The Clark County monitoring system described in this paper allows decisionmakers to track

these impacts and provides critical information necessary to design appropriate mitigative strategies as needed

The monitoring system is composed of seven steps (Figure 1). The first step was to identify key issues and trends in monitoring programs across the United States.



**Fig. 1. The methodology for developing the monitoring program.**

During step two, strategic plans from all Clark County agencies were gathered, analyzed, and catalogued in a web-based database. As part of step three, interviews were conducted with Clark County agency personnel in order to identify existing indicators that are currently being tracked within their departments and to identify key indicators that should be monitored that could identify potential impacts from the Yucca Mountain Project.

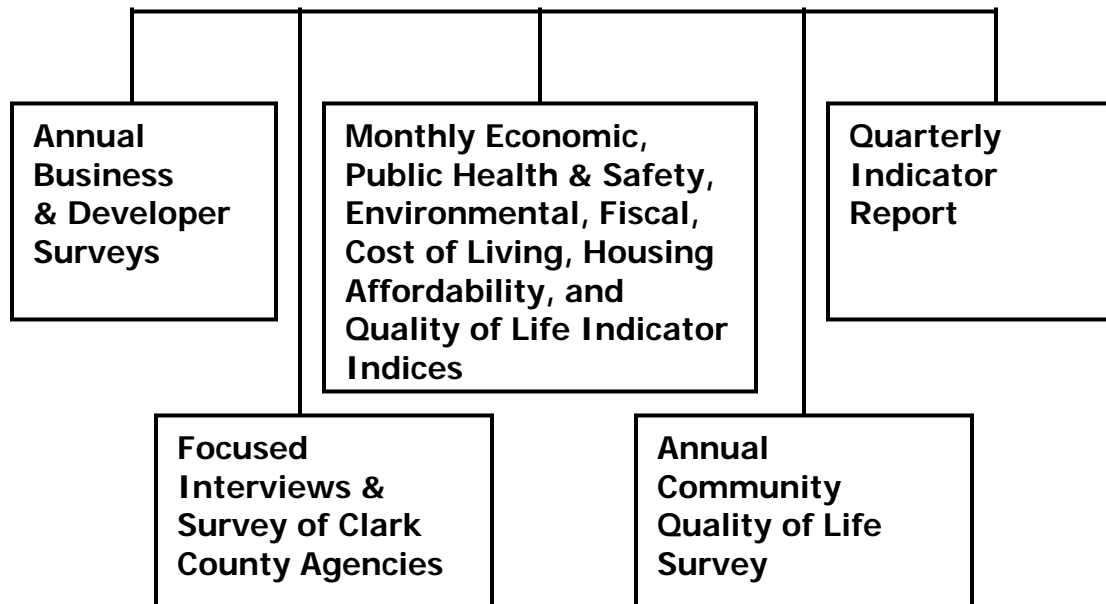
The fourth step of the research was to assess the findings from the interviews in conjunction with national indicators and then to incorporate the selected indicators into the design of the Monitoring Program. Once, final indicators were developed, they were compiled into indices by subject matter.

Step six included reviewing and calibrating each index to ensure that the algorithms accurately reflected historical trends. Key Clark County agency personnel then reviewed the suite of indices that comprise the monitoring program for quality assurance. The Monitoring Program was then pilot tested and subsequently implemented (Step 7).

## **MONITORING PROGRAM**

As noted in the initial paragraphs of this paper, the purpose of the monitoring system is to provide an “early warning” of changes within the social, economic, and/or environmental well-being of Clark County and its residents. While some of the indicators are specific to measuring the impacts from the Yucca Mountain proposal, others are more general and can be influenced by a variety of factors. Thus, the monitoring system provides an integrated system for observing changes within Clark County. Because many questions about the nature and extent of the HNLW shipment campaign to Yucca Mountain remain, the monitoring system should be viewed as a dynamic, integrated system that will continue to evolve as additional information from DOE becomes available. The phased development of the monitoring program began in 1999 as part of Clark County’s comprehensive oversight program. Implementation of the monitoring program commenced in 2004.

The monitoring system is composed of the five components described below (Figure 2). These components build on the baseline of data gathered for the Clark County Impact Report that was sent to the Secretary of Energy and the President of the United States before the decision by the President and Congress to proceed to the site characterization phase with the Yucca Mountain Project. The monitoring system also builds on the recent update to the Impact Report and on the surveys of various stakeholder groups and the general public that have been conducted over the past four years. When viewed holistically, these studies provide a comprehensive framework for assessing the impacts within Clark County from the Yucca Mountain Project. Each component has been designed to leverage the limited resources available for monitoring impacts.



**Fig. 2. Components of the Monitoring System.**

## **MONITORING PROGRAM INDICES**

The Monitoring Program is based on selecting and monitoring performance indicators that provide an early warning that changes are occurring that could affect Clark County residents and/or governmental agencies. 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 seven indices within the Monitoring Program focus on indicators that provide insight into how well Clark County governmental agencies are performing and monitors impacts from factors including the Yucca Mountain Project that might adversely affect services provided by these agencies. The Monitoring Program is comprised of seven indices: economic, environmental, public health and safety, community well-being, housing affordability, fiscal, and cost of living. These indices are composed primarily of outcome measures maintained on an Internet site for easy access by Clark County decision makers. A description of each of these indices follows.

### **Economic Index**

The economic index is illustrated in Table I. Changes in commercial occupancy rates can be an early indicator of a downturn in the business climate. While many factors including the normal economic cycle can lead to a downturn in commercial occupancy, there is the potential that stigma-related impacts from the proposed HLNW shipments may contribute or exacerbate downturns of this type. Similarly, changes in commercial building permit valuation, number of residential building permits, taxable sales, visitor volume, convention attendance, passenger

counts, gross gaming revenues, employment, and unemployment rates can result from a variety of factors, including potential stigma-associated impacts resulting from HLNW shipments. While monitoring these indicators will not directly provide a measure of impacts that may result from the Yucca Mountain Project, they will provide an early warning that change is occurring in the economic well-being of the community that warrants additional investigation. If stigma associated with Yucca Mountain HLNW shipments is found to be a causal factor, then they will help provide needed data to estimate the extent of impact.

**Table I. Sample Economic Index**

Indicator	Period	Value		
		Current	Prior Period	Prior Year
Commercial Occupancy Rate	Aug 04	7.7%	7.7%	8.8%
Commercial Building Permit Valuation	Aug 04	\$80,561,571	\$64,552,777	\$92,601,210
Residential Building Permits	Aug 04	2,232	2,757	1,906
Taxable Sales	Aug 04	\$2,501,585,499	\$2,510,615,750	\$2,265,205,966
Visitor Volume	Aug 04	3,675,471	3,710,725	3,748,225
Convention Attendance	Aug 04	379,071	266,984	572,947
Airport - McCarran	Aug 04	3,639,725	3,699,442	3,242,938
Gross Gaming Revenues	Aug 04	\$726,318,007	\$647,232,950	\$635,873,680
Employment	Aug 04	860,700	853,500	821,700
Unemployment Rate	Aug 04	4.0%	4.6%	5.3%

### Environmental Index

The environmental indicators provide an early measure of changes to the community environmental well-being (Table II). Clark County has shown its commitment to improving air quality and water quality through the many initiatives that it has undertaken and resources that it has provided to meet regulatory standards. The air quality indicators include “good days”, i.e., meets federal regulatory requirements, for carbon monoxide, ozone, particulate matter less than 10 and less than 2.5 microns. The water indicator measured is the number of gallons of treated water per day, per capita.

**Table II. Sample Environmental Index**

Indicator	Period	Value		
		Current	Prior Period	Prior Year
Air Quality (CO Days > Good)	Jul 04	0	0	0
Air Quality (Ozone Days > Good)	Jul 04	21	19	24
Air Quality (PM 10 Days > Good)	Jul 04	14	12	22
Air Quality (PM 2.5 Days > Good)	Jul 04	14	8	3
Water Treated (Gal.) per Day / Capita	Jul 04	55.6	55.3	56.2

While many factors including growth rates and weather conditions can and will influence air and water quality, increased pollutants associated with HLNW shipments could contribute to hindering the progress that Clark County has made in these areas.

**Public Health and Safety Index**

The public health and safety index is composed of key indicators that were identified by the Clark County Fire Department, the Las Vegas Metropolitan Police Department (Metro), the Clark County Health District, and the University Medical Center as significant indicators that will provide decision makers with critical information needed to assess impacts from the Yucca Mountain Project (Table III).

**Table III. Sample Public Health and Safety Index**

Indicator	Period	Value		
		Current	Prior Period	Prior Year
Number of Fire Dept. Incidents	Oct 04	7,771	7,864	7,759
Estimated Damage from Fires	Oct 04	954,562	6,544,435	1,055,621
No. Metro Crimes per 1,000 Residents	Oct 04	6.83	6.61	6.92
Avg. Metro Response Times (minutes)	Oct 04	5.00	5.00	5.00
Traffic Accidents per 1,000 Residents	Oct 04	1.00	1.00	1.00
Birth Defects per 1,000 Residents	Oct 04	0.20	0.20	0.20

The indicators tracked within the public health and safety indices includes: the number of fire department incidents, estimated damages from fires, number of crimes per 1,000 population, average response times, traffic accidents per 1,000 population, and birth defect and chronic disease per 1,000 residents. While all of the public health and safety indicators within this indices are outcome measures that can change because of multiple factors, they each provide vital data that will need to be monitored closely if DOE proceeds with the Yucca Mountain

Project. As additional data is available from DOE, other direct measures of potential impacts from the Yucca Mountain Project will be integrated into the Monitoring Program. For example, the Clark County Fire Department and the Las Vegas Metropolitan Police Department indicate that their current monitoring systems will be expanded to incorporate specific Yucca Mountain-related information as the commencement of the HLNW shipment campaign nears. Both the Fire Department and the Metropolitan Police Department will track Yucca Mountain shipments, calls related to these shipments, and transportation incidents. These data, when coupled with the annual Impact Assessment Report provides vital data for assessing Yucca Mountain-related impacts within Clark County.

### Community Well-Being Index

The community well-being indicators include median existing and new home prices, apartment occupancy rates, home ownership rates, home mortgage rates, consumer confidence index, housing affordability index, high school drop out rates, poverty rates, and the local education tax support per pupil (Table IV).

**Table IV. Sample Community Well-Being Index**

Indicator	Period	Value		
		Current	Prior Period	Prior Year
Median Existing Home Price	Sep 04	\$250,000	\$250,000	\$174,900
Median New Home Price	Sep 04	\$278,924	\$259,700	\$208,265
Apartment Occupancy Rate	Sep 04	95.6%	95.6%	93.9%
Home Ownership Rate	Sep 04	61.0%	61.0%	62.7%
Home Mortgage Interest Rates	Sep 04	5.75%	5.87%	6.15%
Consumer Confidence Index (Regional)	Sep 04	116.0	106.1	96.6
Housing Affordability Index	Sep 04	87.2	88.4	125.1
Dropout Rates (High School)	Sep 04	8.1%	8.1	7.8%
Poverty Rate	Sep 04	10.5%	10.5%	10.3%
Local Education Tax Support Per Pupil	Sep 04	\$3,536	\$3,536	\$3,404

The community well-being indicators monitored are designed to identify stigma-related impacts associated with the Yucca Mountain Project that have the potential for making Clark County a less attractive place to live and work. These impacts could include reduction in property values, particularly along the HLNW shipment routes resulting in lower consumer confidence.

Stigma associated with transporting HLNW also may make it more difficult for the Clark County School District to attract and retain teachers. This, in turn, could adversely affect dropout rates.

Any stigma related downturn in property values would indirectly affect the services that Clark County provides that may result in increases to the poverty rate and less dollars per pupil for education. Monitoring of these indicators will provide insight for decision makers about the nature and extent of the community's response to DOE's proposed Yucca Mountain Project.

### Fiscal Index

The fiscal indicators monitor the financial well-being of Clark County governmental revenues (Table V). Each of these indicators has a direct or indirect impact on Clark County's revenue stream.

**Table V. Sample Fiscal Index**

		Value		
Indicator	Period	Current	Prior Period	Prior Year
Median Existing Home Value	Aug 04	\$250,000	\$247,490	\$172,000
Median New Home Value	Aug 04	\$259,700	\$238,957	\$206,167
Comml. Construction Permit Valuation	Aug 04	\$80,561,571	\$64,552,777	\$92,601,210
Number of Existing Home Sales	Aug 04	5,851	6,139	4,697
Number of New Home Sales	Aug 04	2,502	2,371	2,183
Electric Meter Counts	Aug 04	640,680	638,461	608,255
Taxable Retail Sales - All Activity	Aug 04	\$2,501,585,499	\$2,510,615,750	\$2,264,205,966
Employment	Aug 04	860,700	853,500	821,700

### Cost of Living Index

The Cost of Living Index reports data from the *ACCRA Cost of Living Index* for the Las Vegas Metropolitan Statistical Area (Table VI). This index provides a useful and reasonably accurate measure of living cost differences among urban areas.

**Table VI. Sample Cost of Living Index**

Indicator	Value	
	Q2 2004	Q2 2003
Grocery Items	111.1	107.3
Housing	125.5	98.6
Utilities	83.8	90.1
Transportation	113.7	120.6
Health Care	124.3	124.0
Miscellaneous Goods and Services	106.5	105.1
Composite Index	112.1	104.3



## **Housing Affordability Index**

The Housing Affordability Index is a composite index produced by Economy.com to measure the affordability of single-family residences in Southern Nevada. Since the components of the index are proprietary, the index reports only a composite number. For example, during the month of September 2004, the housing affordability index reported a value of 87.2, representing a 1.3 percent decline from August 2004 and a 30.3 percent decline from the same period of the prior year.

During the same period, the median new home price was nearly 279,000, up 33.9 percent over the prior year. Additionally, the median existing home price was up 42.9 percent over the prior year, reaching \$250,000.

Despite a decline in home mortgage interest rates over the prior year (currently at 5.75 percent), the overall index continues to report sharp declines consistent with home value increases and a lack of similar rises in average household income levels.

## **Quarterly Indicator Reports**

In addition to the monthly indicator indices, the Monitoring Program includes quarterly reports that will examine the trends within each of the indices in greater depth. These quarterly reports will allow additional factors to be evaluated, as appropriate. The quarterly reports, like the monthly indicators, 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 the Internet site so that they can be easily accessed.

## **Annual Survey**

To supplement the monthly indicator indices and the quarterly reports, an annual survey will be included as part of the monitoring system. This survey has been 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.

The survey will focus on gauging impacts to Clark County's well-being. This survey 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.

The results of the survey will be published in an integrated annual report, as described below and will be posted to the Monitoring Program's Internet site.

### **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 a first estimation of impacts were compiled into the Clark County Impact Report that was submitted to the President of the United States, the Secretary of Energy, and Congress in February 2002. The Clark County Impact Report indicated that the impacts from the Yucca Mountain Project to governmental agencies within Clark County will be substantial. For example, the fiscal impact on the public safety agencies just to prepare for HLNW shipments to commence has been estimated at \$275 million (Clark County Impact Report February 2002). Because of the magnitude of the proposed project and the long lead-time necessary to adequately prepare, focused interviews with key Clark County agencies will continue over the duration of the proposed HLNW shipment campaign.

### **Clark County Impact Report**

The indices, the quarterly reports, and the survey provide an early warning of impacts to Clark County residents and governmental agencies. The findings from each of these components of the Monitoring System will periodically be used to update the Clark County Impact Report. The updated Clark County Impact Report will integrate the findings from each of these components of the Monitoring System with a review of capacity issues and other impact issues that are being experienced by Clark County governmental entities as a result of the Yucca Mountain Project. Thus, the Clark County Impact Report will go beyond being an "early warning" system to provide a comprehensive assessment of the challenges being faced by Clark County residents and governmental agencies, as a result of DOE's efforts to site a HLNW repository at Yucca Mountain.

### **CONCLUSION**

Complex, ever-changing, and long-term programs like the proposed Yucca Mountain program have the potential of impacting communities like Clark County in a plethora of ways over time. The Monitoring Program implemented by Clark County is designed to provide a dynamic tool to assist decision makers in assessing impacts as the program evolves over time.

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