

# APPENDIX I

## SOCIOECONOMICS

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This Appendix provides detailed supporting information for the socioeconomic analysis discussed in Section 4.4. Appendix I describes the methodology and assumptions used in the analysis, as well as the direct and indirect output, earnings, and employment impacts for each affected region. Changes in regional population and attendant impacts to public services are also assessed.

### **Economic Impact Methodology**

An examination of economic effects requires a systematic analysis of the relationships among industries within regions because these relationships largely determine how regional economies are likely to respond to project changes. Regional input-output multipliers account for industry relationships within regions and are useful tools for estimating regional economic impacts.

The Regional Input-Output Modeling System (RIMS II) of the U.S. Bureau of Economic Analysis (BEA) was used for this analysis (U.S. Bureau of Economic Analysis 1997). RIMS II is widely used in both the public and private sectors and is based on an accounting framework called an input-output (I-O) table. For each industry, an I-O table shows the distribution of the inputs purchased and the outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table to reflect a region's industrial structure and trading patterns.

Local procurement for goods and services, as well as local expenditures by employees support additional, indirect output, earnings, and jobs. Final-demand multipliers for output, earnings, and employment measure the economic impact of a change in final demand, in earnings, or in employment on a region's economy. Specific RIMS II regional multipliers developed by BEA for Boone County, Arkansas; Otero County, Colorado; Taylor and Reeves counties, Texas; and Quay, Union, and Harding counties, New Mexico were used in this EIS.

For this analysis, the following assumptions were made:

- All economic activity is assumed to occur within the affected counties (i.e., all expenditures are local).
- Maintenance expenditures are assumed to be the same for the existing and proposed scoring and emitter facilities.
- Maintenance expenditures are assumed to equal producers' prices.
- Expenditures associated with the un-manned emitter sites are assumed to occur in the county where the associated scoring facility is located.
- The creation of scoring facility operations positions would result in in-migration of personnel.
- The loss of scoring facility operations positions would result in out-migration of affected personnel.

- Quay, Union, and Harding counties, New Mexico are considered one economic region.

## **1.0 Alternative A: No-Action**

Under Alternative A: No-Action, there would be no construction or changes in existing operations. No new socioeconomic impacts would be associated with this alternative.

## **2.0 Alternative B: IR-178/Lancer MOA**

### **2.1 Construction Impacts**

Under this alternative, construction costs are estimated to range from \$3.6 million to \$5 million for each scoring facility at Abilene, Taylor County, and Pecos, Reeves County. Construction costs for the associated emitter sites would range from \$300,000 to \$680,000 per site. Construction would take place in 2001 and last for 12 to 18 months for each scoring site and less than 2 months for each emitter site. Construction activities would employ an average of eight workers at any one time. Estimated costs to acquire fee, lease, and easement rights for the 10 emitter sites would be approximately \$500,000. For the purposes of this analysis, half of the construction costs associated with the emitter sites are assessed in Taylor County and the other half in Reeves County.

The construction expenditures of approximately \$4.3 million for each scoring facility and \$2.7 million for five emitter sites would total approximately \$7 million each in Taylor and Reeves counties. The impacts of facility construction are shown in Table I-1.

<b>Table I-1. Estimated Construction Impacts Under Alternative B</b>		
<i>Impact Based on the Change in Final Demand</i>	<i>Taylor County</i>	<i>Reeves County</i>
Change in Final Demand	\$7,000,000	\$7,000,000
<i>Final-demand multipliers:</i>		
Output (dollars)	1.6471	1.2934
Earnings (dollars)	0.4892	0.2772
Employment <sup>a</sup> (jobs)	19.9	11.3
<i>Impact on:</i>		
Output	\$11,530,000	\$9,054,000
Earnings	\$3,424,000	\$1,940,000
Employment (jobs)	140	80
<sup>a</sup> The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. <i>Source:</i> U.S. Bureau of Economic Analysis, 1998.		

No changes to population would occur from construction activities. The required construction force of eight workers would be expected to be available from the local labor supply. Indirect jobs associated with construction expenditures would be approximately 140 and 80 in Taylor and Reeves counties, respectively. Most indirect job growth would occur in the services, wholesale, and retail trade industries. This would represent about 1 percent of current employment in both counties. No in-migration would be expected as a result of indirect job growth. Increased earnings as a result of construction activities would represent approximately 1 percent of current county personal income. This would represent a minor beneficial impact to the economy.

## 2.2 Ground Operations Impacts

The scoring facilities in Taylor and Reeves counties would employ 31 and 30 people, respectively, at an average salary of \$30,000. It is assumed that these personnel would in-migrate to the area for employment. Annual maintenance costs for each scoring site would be approximately \$150,000. The emitter sites would be unmanned; annual maintenance costs would be less than \$50,000.

Total earnings paid in Taylor and Reeves counties would be \$930,000 and \$900,000, respectively. Annual maintenance costs would be approximately \$175,000 in each county. Impacts associated with operations are shown in Tables I-2 and I-3.

<i>Industry</i>	<i>Regional Purchases (dollars)</i>	<i>Final-Demand Multiplier</i>			<i>Impact</i>		
		<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment<sup>a</sup> (jobs)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment (jobs)</i>
Utilities	43,750	1.4413	0.2357	6.2	63,000	10,000	1
Wholesale Trade	52,500	1.5560	0.4413	14.9	82,000	23,000	1
Insurance	17,500	1.8682	0.5732	20.9	33,000	10,000	1
Business Services	61,250	1.6593	0.5729	22.0	102,000	35,000	2
Households	930,000	0.9761	0.2659	12.9	907,000	247,000	12
<i>Sub total</i>	1,105,000				1,187,000	325,000	17
Initial Change					175,000	930,000	31
<i>Total</i>					1,362,000	1,255,000	48

<sup>a</sup> The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand.  
 Source: U.S. Bureau of Economic Analysis 1998.

<i>Industry</i>	<i>Regional Purchases (dollars)</i>	<i>Final-Demand Multiplier</i>			<i>Impact</i>		
		<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment<sup>a</sup> (jobs)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment (jobs)</i>
Utilities	43,750	1.5844	0.1657	3.9	69,000	44,000	1
Wholesale Trade	52,500	1.2511	0.2898	9.4	66,000	15,000	1
Insurance	17,500	1.4229	.5096	17.9	25,000	9,000	1
Business Services	61,250	1.3520	0.5060	19.1	83,000	31,000	2
Households	900,000	0.5768	0.1468	7.8	519,000	132,000	7
<i>Subtotal</i>	1,075,000				762,000	231,000	12
Initial Change					175,000	900,000	30
<i>Total</i>					937,000	1,131,000	42

<sup>a</sup> The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand.  
Source: U.S. Bureau of Economic Analysis 1998.

Given an average household size of 2.8 and 3.3 in Taylor and Reeves counties, respectively (U.S. Census 1990), direct population change as a result of operations would be 87 in Taylor County and 99 in Reeves County. This would represent less than 1 percent of county population. No impacts would be expected to population-affected resources such as schools, libraries, fire and police protection, housing, etc.

Indirect jobs created as a result of operations would be 17 and 12 in Taylor and Reeves counties, respectively. Most indirect job growth would occur in the services, wholesale, and retail trade industries. Indirect job growth would represent less than 1 percent of county employment. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rates and no in-migration of labor would be expected.

Increased earnings as a result of operations would represent approximately 1 percent of current county personal income. This would represent a minor beneficial impact to the economy.

### **2.3 Decommissioning Impacts**

Under Alternative B, the electronic scoring facilities located in Harrison, Boone County, Arkansas and La Junta, Otero County, Colorado would be decommissioned and the equipment from the associated eight emitter sites removed. The decommissioning of the facilities would result in the loss of 30 positions in Harrison and 31 positions in La Junta. Affected personnel are assumed to move from the areas. The scoring facilities would be offered for sale to other federal and local governmental agencies and the leased emitter site property would be returned to the landowners.

Decommissioning would result in the loss of earnings of \$900,000 and \$930,000 in Boone and Otero counties, respectively. In each county, annual maintenance expenditures of \$150,000 for the scoring facilities and \$20,000 for the associated emitter sites would cease. Impacts associated with decommissioning are shown in Tables I-4 and I-5.

**Table I-4. Estimated Decommissioning Impacts in Boone County Under Alternative B**

Industry	Regional Purchases (dollars)	Final-Demand Multiplier			Impact		
		Output (dollars)	Earnings (dollars)	Employment <sup>a</sup> (jobs)	Output (dollars)	Earnings (dollars)	Employment (jobs)
Utilities	-42,500	1.2994	0.2069	6.5	-55,000	-9,000	-1
Wholesale Trade	-51,000	1.4112	0.3720	15.1	-72,000	-19,000	-1
Insurance	-17,000	1.5673	0.5674	25.3	-27,000	-10,000	-1
Business Services	-59,500	1.4972	0.5787	31.7	-89,000	-34,000	-2
Households	-900,000	0.7695	0.1952	11.1	-693,000	-176,000	-10
<i>Subtotal</i>	-1,070,000				-936,000	-248,000	-15
Initial Change					-170,000	-900,000	-30
<i>Total</i>					-1,106,000	-1,148,000	-45

<sup>a</sup>: The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand.  
 Source: U.S. Bureau of Economic Analysis 1998.

**Table I-5. Estimated Decommissioning Impacts in Otero County Under Alternative B**

Industry	Regional Purchases (dollars)	Final-Demand Multiplier			Impact		
		Output (dollars)	Earnings (dollars)	Employment <sup>a</sup> (jobs)	Output (dollars)	Earnings (dollars)	Employment (jobs)
Utilities	-42,500	1.2458	0.1873	5.2	-53,000	-43,000	-1
Wholesale Trade	-51,000	1.3421	0.3442	11.5	-68,000	-18,000	-1
Insurance	-17,000	1.4949	0.5753	21	-25,000	-10,000	-1
Business Services	-59,500	1.4394	0.5213	21.7	-86,000	-31,000	-2
Households	-930,000	0.6950	0.1850	9.3	-646,000	-172,000	-9
<i>Subtotal</i>	-1,100,000				-878,000	-274,000	-14
Initial Change					-170,000	-930,000	-31
<i>Total</i>					-1,048,000	-1,204,000	-45

<sup>a</sup>: The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand.  
 Source: U.S. Bureau of Economic Analysis 1998.

Given an average household size of 2.5 and 2.7 in Boone and Otero counties, respectively (U.S. Census 1990), direct population loss as a result of decommissioning would be 75 in Boone County and 84 in Otero County. This would represent less than 1 percent of county population. No impacts would be expected to population-affected resources such as schools, libraries, fire and police protection, and housing.

Indirect jobs lost as a result of decommissioning would be 15 and 14 in Boone and Otero Counties, respectively. Most indirect job loss would occur in the services, wholesale, and retail trade industries. Indirect job loss would represent less than 1 percent of county employment. The county economies would be expected to absorb this additional capacity of labor; no significant change in the unemployment rates or out-migration of labor would be expected.

Lost earnings as a result of decommissioning would represent approximately 1 percent of current county personal income. This would represent a minor negative impact to the economy.

### **3.0 Alternative C: IR-178/Texon MOA**

#### **3.1 Construction Impacts**

Impacts would be the same as those described for Alternative B.

#### **3.2 Operations Impacts**

Impacts would be the same as those described for Alternative B.

#### **3.3 Decommissioning Impacts**

Impacts would be the same as those described for Alternative B.

### **4.0 Alternative D: IR-153/Mt. Dora MOA**

#### **4.1 Construction Impacts**

For the proposed Taylor County, Texas site, construction impacts would be the same as described under Alternative B. The proposed three scoring sites in New Mexico are located in Quay, Union, and Harding counties, near Tucumcari. Given the size and economic activity in the region, the three counties are considered one economic region for this analysis. Construction costs for the proposed Tucumcari scoring site would range from \$3.6 million to \$5 million. Construction costs for the associated emitter sites would range from \$300,000 to \$680,000 per site. Construction would take place in 2001 and last for 12 to 18 months for the scoring site and less than 2 months for each emitter site. Construction activities would employ an average of eight workers at any one time. Costs to acquire fee, lease, and easement rights for the 10 emitter sites would be approximately \$500,000. For the purposes of this analysis, half of the construction costs associated with the emitter sites are assessed in Taylor County, Texas, and the other half in the tri-county region of Quay, Union, and Harding counties, New Mexico.

The construction expenditures of approximately \$4.3 million for the scoring facility and \$2.7 million for five emitter sites would total approximately \$7 million in the tri-county region. The impacts of facility construction are shown in Table I-6.

<b>Table I-6. Estimated Construction Impacts Under Alternative D</b>	
<i>Impact Based on the Change in Final Demand</i>	<i>Tri-County Region of Quay, Union, and Harding Counties</i>
Change in Final Demand	\$7,000,000
<i>Final-demand multipliers:</i>	
Output (dollars)	1.3992
Earnings (dollars)	0.3927
Employment <sup>a</sup> (jobs)	18.9
<i>Impact on:</i>	
Output	\$9,794,000
Earnings	\$2,749,000
Employment (jobs)	133
<sup>a</sup> The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand.	
<i>Source:</i> U.S. Bureau of Economic Analysis 1998.	

No changes to population would occur from construction activities. The required construction force would be expected to be available from the local labor supply. Indirect jobs associated with construction expenditures would be approximately 133. Most indirect job growth would occur in the services, wholesale, and retail trade industries. This would represent about 2 percent of current employment. No in-migration would be expected as a result of new indirect job growth. Increased earnings would represent approximately 2 percent of current regional personal income. This would represent a minor beneficial impact to the regional economy.

## **4.2 Operations Impacts**

For the proposed Taylor County site, ground operations impacts would be the same as described for Alternative B. The facility near Tucumcari would employ 30 people at an average salary of \$30,000. It is assumed that all these personnel would in-migrate to the area for employment. Annual maintenance costs for the Tucumcari site would be approximately \$150,000. The emitter sites would be unmanned; annual maintenance costs would be less than \$50,000.

Total earnings paid in the region would be \$900,000. Annual maintenance costs would be approximately \$175,000. Impacts associated with operations are shown in Table I-7.

**Table I-7. Estimated Operations Impacts in the Tri-County Region, New Mexico Under Alternative D**

Industry	Regional Purchases (dollars)	Final-Demand Multiplier			Impact		
		Output (dollars)	Earnings (dollars)	Employment <sup>a</sup> (jobs)	Output (dollars)	Earnings (dollars)	Employment (jobs)
Utilities		1.4031	0.2496	8.3	61,000	11,000	1
Wholesale Trade	52,500	1.3479	0.4203	16.8	71,000	22,000	1
Insurance	17,500	1.5030	0.5670	24.9	26,000	10,000	1
Business Services	61,250	1.3900	0.5133	23.4	85,000	31,000	2
Households	900,000	0.6436	0.1759	9.9	579,000	158,000	9
<i>Subtotal</i>	1,075,000				822,000	232,000	14
Initial Change					175,000	900,000	30
<i>Total</i>					997,000	1,132,000	44

<sup>a</sup>: The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand.  
 Source: U.S. Bureau of Economic Analysis 1998.

Given an average household size of 2.6 in the tri-county region (U.S. Census 1990), direct population change as a result of operations would be 78. This would represent less than 1 percent of regional population. No impacts would be expected to population-affected resources such as schools, libraries, fire and police protection, and housing.

Indirect jobs created as a result of operations would be 14, less than 1 percent of regional employment. Most indirect job growth would occur in the services, wholesale, and retail trade industries. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rates and no in-migration of labor would be expected.

Increased earnings as a result of operations would represent approximately 1 percent of current regional personal income. This would represent a minor beneficial impact to the regional economy.

### **4.3 Decommissioning Impacts**

The impacts would be the same as those described for Alternative B.

## **References**

U.S. Bureau of Economic Analysis. 1998. Regional Multipliers for Boone County, AR; Otero County, CO; Taylor County, TX; Reeves County, TX; and Harding, Quay, and Union Counties, NM. December. Washington, DC.

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