

**An Assessment of the Economic Impact of the Rosemont Copper  
Project on Pima County, Arizona using the IMPLAN Regional  
Economic Forecasting Model**

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**Executive Summary**

This report measures the economic impact of the Rosemont Copper Project on employment, labor income, output, gross regional product and tax revenue in Pima County, Arizona, during the project's construction, production, and post-production phases which span a period of 27 years. Estimated impacts include both the direct effects of Rosemont Copper Project operations and multiplier effects that arise when income is recycled within the county's economy. The IMPLAN input-output model was used to estimate multiplier effects.

### **Economic Impacts during the Construction Phase**

The construction phase will last 4 years, with the last year of construction overlapping with the first year of production. Local construction expenditures will be \$576 million, and total economic impacts, shown in Table 1, amount to \$983 million in output, 8,376 person-years of employment, \$382 million in labor income and \$506 million in gross regional product.

### **Economic Impacts during the Production and Post-Production Phase**

The production phase will last 21 years, followed by a post-production phase of 3 years. Table 1 summarizes the total impacts and provides a breakdown of direct and indirect effects; detailed figures are discussed in sections 3 and 4.

The total impact of the Rosemont Copper Project over the duration of the production and post-production phases on the economy of Pima County is estimated to be 41,501 person-years of employment, gross regional product of \$5.9 billion, output of \$20,511 million and labor income of \$2.3 billion. Annual average impacts - calculated over the 21-year period of full production- will be 1,784 jobs, \$260 million of gross regional product, output of \$923 million and labor income of \$100 million.

**Table 1: Rosemont Copper Project –Summary of Economic Impacts on the Economy of Pima County, Arizona**  
(Millions 2011\$)

	Output	Jobs	Labor Income	Gross Regional Product
<b>Construction</b>				
Total	983.0	8,376	381.5	506.4
Annual Average	245.8	2,094	95.4	126.6
<b>Production</b>				
Total	20,511.1	41,501	2,304.1	5,907.5
Annual Average*	922.9	1,784	99.9	260.2
Direct Operations				
Total	16,115.2	9,963	797.7	3,615.0
Annual Average*	741.7	443	36.0	163.1
Employee Spending				
Total	593.2	5,302	200.9	360.1
Annual Average*	26.8	240	9.1	16.3
Vendor Purchases				
Total	3,362.6	20,664	1,024.7	1,572.4
Annual Average*	135.8	865	43.0	65.6
Tax Impacts				
Total	440.2	5,572	280.8	360.1
Annual Average*	18.6	236	11.9	15.2

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

*Source: L. William Seidman Research Institute, W.P. Carey School of Business, Arizona State University*

In an average mid-production year, Rosemont Copper Project will employ 443 workers with wage and salary payments amounting to \$27 million and labor income of \$36 million. Average annual production costs will be \$346 million; average annual output will be \$742 million. The gross regional product directly associated with Rosemont Copper Project operations will be an annual \$163 million. Over the life of the mine, these

direct impacts will cumulate to 9,963 person-years of employment, labor income of \$798 million, output of \$16.1 billion and gross regional product of \$3.6 billion.

In economic impact analysis, estimates are also made of the effects that arise when workers spend a portion of their incomes in state. Seidman Institute's estimates of these employee spending effects averaged annually 240 jobs, \$16 million in gross regional product, \$9 million in labor income and \$27 million in output. Over the life of the project, these effects will cumulate to 5,302 person-years of employment, gross regional product of \$360 million, labor income of \$201 million and output of \$593 million.

Rosemont Copper Project purchases from local vendors located in Pima County will amount to \$90 million annually (or a total of \$2.3 billion in goods and services from local suppliers over the lifetime of the project). The direct and indirect average annual employment impacts associated with vendor purchases will be 865 jobs and annual labor income impacts of \$43 million. Annual impacts in terms of gross regional product will be \$66 million; output impacts will average \$136 million. Over the life of the mine, total economic impacts generated by vendor purchases made by the Rosemont Copper Project in Pima County will be 20,664 person-years of employment, \$1.6 billion in gross regional product, \$3.4 billion in output and \$1 billion in labor income.

Another important effect to consider is the spending of new tax revenues. Rosemont Copper Project is estimated to generate, both directly and indirectly, a total of \$809 million in tax revenues over the duration of the project for state and local governments (\$40 million annually). The spending of the local share of these tax dollars will be responsible for 236 jobs, \$15 million in gross regional product, \$12 million in labor income and \$19 million in output annually in Pima County. Over the lifetime of the project, these tax effects will amount to 5,572 person-years of employment, \$360 million in gross regional product, \$281 million in labor income and \$440 million in output.

The economic impact figures listed above are substantial. Reasons include a large employment base with well-paid workers, substantial purchases from local vendors, and large tax payments made by the Rosemont Copper Project.

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# **The Economic Impact of the Rosemont Copper Project On the Economy of Pima County, Arizona**

## **1. Introduction**

The Rosemont Copper Project is an open-pit mining operation to be developed on a 15,000 acre site in Pima County, Arizona. The Rosemont deposit is primarily a copper deposit but also includes molybdenum and silver. The Project will produce more than 230 million lbs of copper per year (roughly 10 percent of annual US production) for approximately 20 years. Average annual production of molybdenum and silver will be 5 million lbs and 3.5 million oz, respectively.

The Project will start with a construction (pre-production) phase which is projected to last 4 years. The main production phase will start during the last year of construction, and will last 21 years. It will be followed by a post-production phase of 3 years during which the mine is closed and reclamation activities are implemented.

The total cost of developing the site for mining and construction of the processing facilities will be \$913 million. The Project will employ an average of 443 workers annually during the main production phase, drawn from a locally available pool of workers. Purchases from vendors located in Pima County will amount to \$90 million annually.

The purpose of this report is to measure the economic impact of the Rosemont Copper Project on employment, gross regional product, output, labor income, and tax revenues in Pima County, as well as compare them to existing reports published by Applied Economics (AE) in 2011 and the US Forest Service (also 2011). Estimated impacts include both the direct effects of the Rosemont Copper Project's operations and multiplier effects that arise when income is recycled within the county's economy. For comparison, impacts reported by Applied Economics are displayed at the end of each section and subsection. Section 2 of the report reviews the economic impact methodology and the primary data used in the calculations. Section 3 provides estimates of the impact of the Rosemont Copper Project's operations during the construction phase and during the

production phase. Section 4 provides estimates of the impact of the Rosemont Copper Project on local tax revenues in Pima County. Section 5 summarizes total economic impacts, and section 6 discusses conclusions and compares the results to other economic impact studies of the Rosemont Copper Project.

## **2. Data and Methodology**

Economic impact analysis traces the full impact, direct and indirect, of an economic activity on jobs and incomes in a local economy. Operations at a company such as the Rosemont Copper project directly affect an economy through the jobs provided to company workers and the jobs supported among first-tier suppliers. Indirect effects arise when suppliers place upstream demands on other producers, when workers either directly or indirectly associated with the operations spend a portion of their incomes in the local economy, and when governments spend new tax revenues. In the end, the cumulative changes in jobs and incomes are a multiple of the initial direct effects.

Economic impacts were estimated using the Pima County module of IMPLAN, an input-output model developed and maintained by the Minnesota IMPLAN Group, Inc.

Economic impacts were measured in terms of four variables:

- Output: comprises the value of industry production, or the value of all goods and services produced in the region.
- Gross Regional Product: is synonymous with value added. It represents the dollar value of all goods and services produced for final demand in the region. It excludes the value of intermediate goods and services purchased as inputs to final production. It can also be defined as the sum of employee compensation (wages, salaries and benefits, including employer contributions to health insurance and retirement pensions), proprietor income, property income, and indirect business taxes.
- Employment: is a count of full- and part-time jobs. It includes both wage and salary workers and the self-employed. Combined jobs over the years represent “person-years of employment,” a measure of years of employment.
- Labor Income: includes all forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.

Primary company-level data were provided by Rosemont Copper Company, a subsidiary of Augusta Resource Corporation. Data included projected annual total wage and salary payments, benefits, and employment. Rosemont Copper Project also provided detailed production costs, capital expenditures, and taxes and fees paid to federal, state and local governments. Data were for the construction years (referred to as PP3, PP2, and PP1) and the production and post-production years (years 1-24).

All monetary amounts in this report are reported in terms of 2011 dollars. Economic impacts reported by Applied Economics (AE) have been converted to 2011 dollars (the original numbers were in 2008 dollars); and the Seidman Institute (SI) has also calculated person-years of employment corresponding to AE's results to facilitate comparison with SI's results (AE does not report person-years of employment).

A technical appendix at the end of this report provides additional details on the data and estimation procedures used in this analysis.

### **3. Economic Impact of the Rosemont Copper Project**

#### **3.1. Construction Impacts**

Expenditures during the 4 year construction phase will be \$913 million. However, a large share of the specialized equipment and services to be purchased are not produced within Pima County. Total local spending (purchases from vendors located in Pima County) is estimated at \$576 million.

The economic effects of the construction phase are displayed in Table 2A. Total impacts over the entire construction period will amount to \$983 million in output, 8,376 person-years of employment, \$382 million in labor income and \$506 million in gross regional product. Annual averages will be \$246 million in output, 2,094 jobs, \$95 million in labor income and \$127 million in gross regional product.

Direct economic effects are expected to be 4,677 person-years of employment, \$230 million in labor income and \$262 million in gross regional product. Annual averages during the 4-year construction period will be \$144 million in direct construction



expenditures, 1,169 jobs, \$58 million in labor income, and \$65 million in gross regional product. Table 2B displays results for the construction phase impacts obtained by Applied Economics.

**Table 2A: Rosemont Copper Project –Economic Impacts of the Construction Phase  
Pima County  
Seidman Institute Results  
(Millions 2011\$)**

	Direct				Total			
	Construction Expenditures	Jobs	Labor Income	Gross Regional Product	Output	Jobs	Labor Income	Gross Regional Product
Total	575.9	4,677	230.2	261.7	983.0	8,376	381.5	506.4
Annual Average*	144.0	1,169	57.6	65.4	245.8	2,094	95.4	126.6

\*Annual average values for the construction phase refer to years 1 - 4 when construction activities will occur.

**Table 2B: Rosemont Copper Project –Economic Impacts of the Construction Phase  
Pima County  
Applied Economics Results  
(Millions 2011\$)**

	Direct			Total		
	Local Expenditures	Jobs	Personal Income	Output	Jobs	Personal Income
Total	369.3	2,376	128.7	585.2	4,148	201.4
Annual Average*	92.3	594	32.2	146.3	1,037	50.4

\*Annual average values for the construction phase refer to years 1 - 4 when construction activities will occur.

Results obtained by the Seidman Institute are larger, but they are based on larger local expenditures.

### 3.2. Production and Post-Production Impacts

The operations phase (full production phase) will have a duration of 21 years- this will be the period of greatest economic impact, not only because of its duration, but because it includes the peak employment, income and tax revenue generation periods. It will be followed by a 3-year post-production period, when mineral recovery employment at the site will wind down, but economic activity will continue due to reclamation and restoration of the site for future uses.

### **3.2.1. Direct Impacts of Rosemont Copper Project Operations**

Direct impacts of operations will be the value of production (production costs), and the wages and salaries paid to mine employees. Table 3A shows the direct contribution of Rosemont Copper Project operations to employment, labor income, output and gross regional product in Pima County. These direct effects over the lifetime of the project are estimated to be \$16.1 billion in output, 9,963 person-years of employment, \$606 million direct wage and salary payments to employees, and \$3.6 billion in gross regional product. These result in annual averages of \$742 million in output, \$27 million in wages and salaries, and \$163 million in gross regional product during the main production period (years 1-21).

Once in operation, Rosemont Copper Project will employ an average of 443 workers annually during the main production period with total wages and salaries of \$27 million. If health and retirement benefits and government social insurance are included, the total compensation of these employees averages \$36 million per year. The average annual wage of a Rosemont Copper worker in this model is \$60,350, which is well above the average wage of a worker in Pima County.

Following Table 3A (below), results reported by Applied Economics are set out in Table 3B. Data used by the Seidman Institute were obtained more recently and the figures are higher; for a more detailed discussion see Section 6.

**Table 3A: Rosemont Copper Project –Direct Impacts  
Pima County  
Seidman Institute**

(Millions 2011\$)

	Output	Jobs	Wages & Salaries	Labor Income	Gross Regional Product
Total	16,115.2	9,963	605.6	797.7	3,615.0
Annual Average*	741.7	443	27.4	36.0	163.1
Year					
Construction Phase					
PP3					
PP2		152	6.8	9.7	44.0
PP1		428	18.4	24.7	111.9
Production Phase					
1	7.0	476	28.2	37.0	167.7
2	209.6	471	29.2	38.3	173.8
3	1,014.1	483	29.7	39.1	177.0
4	960.8	477	29.4	38.6	175.1
5	799.9	490	30.0	39.5	178.8
6	812.5	494	30.2	39.7	179.8
7	718.0	483	29.7	39.0	176.9
8	818.3	468	28.8	37.9	171.8
9	810.3	463	28.6	37.6	170.6
10	835.0	459	28.1	36.9	167.4
11	843.4	472	28.7	37.7	171.1
12	858.0	490	29.5	38.8	176.0
13	762.3	482	29.2	38.4	173.8
14	653.5	475	28.9	37.9	171.9
15	763.6	467	28.5	37.4	169.6
16	819.3	444	27.2	35.7	161.9
17	806.6	396	24.6	32.3	146.5
18	764.2	333	21.7	28.6	129.5
19	799.9	329	21.5	28.3	128.4
20	803.3	333	21.7	28.6	129.4
21	716.1	327	21.4	28.1	127.6
Post-Production Phase					
22	539.4	35	2.8	3.7	16.7
23	0.0	18	1.5	1.9	8.8
24	0.0	18	1.5	1.9	8.8

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

**Table 3B: Rosemont Copper Project –Direct Impacts**  
**Pima County**  
**Applied Economics**  
(Millions 2011\$)

	Output	Jobs	Wages & Salaries
Total	4,988.0	9,678	535.9
Annual Average*	234.4	434	24.2
Year			
Construction Phase			
PP3			
PP2	10.3	196	6.9
PP1	55.8	362	21.5
Production Phase			
1	220.4	454	26.1
2	266.6	454	26.0
3	254.9	461	26.3
4	263.2	461	26.4
5	281.3	461	26.4
6	274.4	461	26.4
7	260.5	461	26.4
8	255.8	461	26.4
9	256.5	461	26.4
10	243.2	461	26.4
11	269.7	478	27.2
12	246.8	478	27.1
13	252.0	478	27.1
14	249.3	478	27.1
15	238.8	478	27.1
16	225.9	379	21.9
17	211.5	351	20.4
18	211.3	351	20.3
19	197.8	351	20.2
20	197.8	351	20.4
21	43.9	351	5.8

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

### 3.2.2. Employee Spending

Employees spend a large part of their income on goods and services (approximately 85 percent according to the Bureau of Labor Statistics' annual Consumer Expenditure Survey). Most is spent in the local economy, supporting additional jobs at local establishments. Consumer spending of Rosemont Copper Project employees is expected to average \$23 million annually and to total \$515 million over the lifetime of the project as shown in Table 4A.

Direct effects (jobs and income at the establishments where employees shop) will consist of annual averages of 137 jobs, labor income of \$5 million and gross regional product of \$9 million annually. Over the life of the mine, total direct effects will amount to 3,037 person-years of employment, \$116 million in labor income and \$207 million in gross regional product.

Total annual effects (which in addition to the direct effects includes jobs and income at the local suppliers of establishments where Rosemont Copper Project employees shop, as well as expenditures of these establishments' employees) will be \$27 million in output, 240 jobs, \$9 million in labor income, and \$16 million in gross regional product. These will cumulate to output of \$593 million, 5,302 person-years of employment, labor income of \$201 million and gross regional product of \$360 million over the life of the mine.

Following Table 4A, employee spending impacts as reported by Applied Economics are set out below in Table 4B. See Section 6 for a discussion about how the results compare.

### **3.2.3. Vendor Purchases**

The Rosemont Copper Project will make significant contributions to the local economy through their purchases of goods and services from local suppliers. Total Rosemont Copper Project transactions with local vendors will amount to \$90 million annually during the main production years, or a total of \$2.3 billion in goods and services from local suppliers over the lifetime of the project. The most important categories of vendor

**Table 4A: Rosemont Copper Project –Employee Spending Impacts  
Pima County  
Seidman Institute Results  
(Millions 2011\$)**

	Direct				Total			
	Consumer Expenditures	Jobs	Labor Income	Gross Regional Product	Output	Jobs	Labor Income	Gross Regional Product
Total	514.8	3,037	115.9	207.3	593.2	5,302	200.9	360.1
Annual Average*	23.3	137	5.2	9.4	26.8	240	9.1	16.3
Year								
Construction Phase								
PP3								
PP2	5.7	34	1.3	2.3	6.6	59	2.2	4.0
PP1	15.7	92	3.5	6.3	18.1	161	6.1	11.0
Production Phase								
1	23.9	141	5.4	9.6	27.6	247	9.3	16.8
2	24.8	146	5.6	10.0	28.6	255	9.7	17.3
3	25.3	149	5.7	10.2	29.1	260	9.9	17.7
4	25.0	147	5.6	10.1	28.8	257	9.7	17.5
5	25.5	150	5.7	10.3	29.4	263	10.0	17.8
6	25.6	151	5.8	10.3	29.6	264	10.0	17.9
7	25.2	149	5.7	10.2	29.1	260	9.8	17.7
8	24.5	145	5.5	9.9	28.2	252	9.6	17.1
9	24.3	144	5.5	9.8	28.0	251	9.5	17.0
10	23.9	141	5.4	9.6	27.5	246	9.3	16.7
11	24.4	144	5.5	9.8	28.1	251	9.5	17.1
12	25.1	148	5.7	10.1	28.9	259	9.8	17.6
13	24.8	146	5.6	10.0	28.6	255	9.7	17.3
14	24.5	145	5.5	9.9	28.3	253	9.6	17.2
15	24.2	143	5.4	9.7	27.9	249	9.4	16.9
16	23.1	136	5.2	9.3	26.6	238	9.0	16.2
17	20.9	123	4.7	8.4	24.1	215	8.1	14.6
18	18.4	109	4.2	7.4	21.3	190	7.2	12.9
19	18.3	108	4.1	7.4	21.1	188	7.1	12.8
20	18.4	109	4.2	7.4	21.2	190	7.2	12.9
21	18.2	107	4.1	7.3	20.9	187	7.1	12.7
Post-Production Phase								
22	2.4	14	0.5	1.0	2.8	25	0.9	1.7
23	1.3	8	0.3	0.5	1.5	13	0.5	0.9
24	1.3	8	0.3	0.5	1.5	13	0.5	0.9

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

**Table 4B: Rosemont Copper Project –Employee Spending Impacts  
Pima County  
Applied Economics Results  
(Millions 2011\$)**

	Direct			Total		
	Consumer Expenditures	Jobs	Labor Income	Output	Jobs	Labor Income
Total	444.8	2,400	86.2	598.5	3,681	135.1
Annual Average*	20.1	108	3.9	27.0	166	6.1
Year						
Construction Phase						
PP3						
PP2	5.7	31	1.1	7.7	47	1.7
PP1	17.8	96	3.4	24.0	147	5.4
Production Phase						
1	21.6	117	4.2	29.1	179	6.6
2	21.6	117	4.2	29.1	179	6.6
3	21.8	118	4.2	29.4	181	6.6
4	21.9	118	4.2	29.4	181	6.6
5	21.9	118	4.2	29.5	181	6.7
6	21.9	118	4.2	29.4	181	6.6
7	21.9	118	4.2	29.4	181	6.6
8	21.9	118	4.2	29.4	181	6.6
9	21.9	118	4.2	29.5	181	6.7
10	21.9	118	4.2	29.4	181	6.6
11	22.5	122	4.4	30.3	187	6.9
12	22.5	121	4.4	30.3	186	6.8
13	22.5	122	4.4	30.3	187	6.8
14	22.5	121	4.4	30.3	186	6.8
15	22.5	121	4.4	30.3	186	6.8
16	18.2	98	3.5	24.5	151	5.5
17	16.9	91	3.3	22.8	140	5.1
18	16.8	91	3.3	22.7	139	5.1
19	16.8	91	3.2	22.6	139	5.1
20	16.9	91	3.3	22.8	140	5.1
21	4.8	26	0.9	6.4	40	1.4

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

payments are projected to be for industrial machinery and equipment repair, maintenance and parts (37 percent), diesel fuel (24 percent), and purchases of manufactured or wholesale goods (e.g. mining equipment, supplies; 15 percent).

Approximately 3 percent of Rosemont Copper Project payments will be for utilities (electricity and water). Services (such as legal, engineering, computer-related and other business services) will represent 6 percent of vendor transactions. About 10 percent will be for support activities for mining, such as blasting.

Table 5A shows the direct and total impacts that will be generated in the Pima County economy because of vendor purchases that will be made by the Rosemont Copper Project. During the main production years, the Rosemont Copper Project will directly support 460 jobs and create \$27 million direct labor income and \$38 in gross regional product annually.

These direct impacts will amount to 10,845 person-years of employment, \$634 million in labor income, and \$913 million in gross regional product over the life of the mine. (Table 5B, following Table 5A, displays impacts of vendor purchases reported by Applied Economics.)

The total impacts (which include indirect effects that arise when the local vendors engage in additional local spending) will be 865 jobs annually, an average annual output of \$136 million, labor income of \$43 million, and gross regional product of \$66 million per year. Total effects over the lifetime of the project are estimated at \$3.4 billion in output, 20,644 person-years of employment, \$1 billion in labor income and \$1.6 billion in gross regional product.



**Table 5A: Rosemont Copper Project –Impacts of Local Vendor Purchases  
Pima County  
Seidman Institute Results  
(Millions 2011\$)**

	Direct				Total			
	Local Expenditures	Jobs	Labor Income	Gross Regional Product	Output	Jobs	Labor Income	Gross Regional Product
Total	2,256.0	10,845	634.1	912.9	3,362.6	20,664	1,024.7	1,572.4
Annual Average*	90.0	460	26.9	38.3	135.8	865	43.0	65.6
Year								
Construction Phase								
PP3	7.4	19	1.1	1.6	9.7	40	1.9	3.0
PP2	83.6	330	19.1	29.7	123.2	691	33.6	53.5
PP1	254.5	748	43.0	65.7	344.0	1,556	75.8	119.4
Production Phase								
1	117.6	452	26.7	39.9	170.5	924	45.7	71.3
2	116.1	590	34.2	46.6	177.8	1,146	56.1	83.4
3	100.6	493	29.0	41.8	151.4	942	46.9	72.0
4	84.5	431	25.5	36.6	128.8	822	41.0	62.9
5	106.9	553	32.3	45.7	161.5	1,036	51.5	78.3
6	107.1	628	36.5	50.8	165.9	1,148	57.0	85.9
7	99.0	577	33.6	46.6	153.4	1,058	52.6	79.0
8	81.5	407	24.1	34.7	123.6	779	38.9	59.7
9	97.6	505	29.6	41.8	147.9	950	47.3	71.8
10	100.8	536	31.4	44.1	153.3	1,001	49.8	75.4
11	121.2	666	38.7	53.6	184.2	1,225	60.7	91.2
12	116.0	567	33.1	47.7	172.4	1,063	52.9	81.2
13	101.6	522	30.6	43.9	152.8	973	48.5	74.4
14	95.2	495	29.1	41.8	144.0	925	46.2	70.9
15	92.1	485	28.4	40.7	139.4	901	44.9	68.8
16	81.8	408	24.0	34.8	122.6	766	38.2	59.1
17	67.8	322	19.0	27.9	100.9	612	30.6	47.5
18	52.4	264	15.4	22.1	78.3	493	24.5	37.6
19	57.5	321	18.6	25.9	87.2	584	28.9	43.6
20	46.5	218	12.8	18.8	68.8	414	20.6	32.1
21	45.1	215	12.6	18.4	66.9	406	20.2	31.3
Post-Production Phase								
22	13.7	45	2.9	7.4	20.9	107	5.5	11.7
23	4.1	25	1.5	2.3	7.0	52	2.5	4.0
24	3.7	24	1.4	2.0	6.3	47	2.3	3.6

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

**Table 5B: Rosemont Copper Project –Impacts of Local Vendor Purchases  
Pima County  
Applied Economics Results  
(Millions 2011\$)**

	Direct			Total		
	Local Expenditures	Jobs	Personal Income	Output	Jobs	Personal Income
Total	2,668.7	14,299	771.0	3,785.9	23,284	1,125.7
Annual Average*	125.5	672	36.2	177.9	1,094	52.9
Year						
Construction Phase						
PP3						
PP2	2.8	21	0.9	4.2	32	1.3
PP1	30.5	170	9.1	45.0	282	13.6
Production Phase						
1	111.2	569	31.7	157.5	938	46.3
2	134.4	701	38.5	190.2	1,148	56.2
3	139.9	737	40.4	198.4	1,208	59.0
4	139.0	731	40.1	197.1	1,197	58.5
5	164.2	910	48.1	233.8	1,472	70.2
6	152.5	824	44.3	216.6	1,340	64.7
7	137.1	719	39.4	194.3	1,178	57.6
8	133.2	698	38.3	188.6	1,142	55.9
9	142.6	777	41.5	202.6	1,260	60.5
10	126.6	671	36.4	179.5	1,095	53.1
11	156.1	883	45.8	222.3	1,418	66.9
12	145.8	816	42.5	207.5	1,313	62.1
13	141.8	784	41.2	201.6	1,266	60.2
14	134.8	742	39.1	191.5	1,199	57.1
15	123.8	674	35.6	175.5	1,090	52.1
16	119.9	654	34.5	169.9	1,056	50.3
17	105.3	541	30.0	148.3	888	43.7
18	103.5	529	29.5	145.6	868	42.9
19	93.9	461	26.5	132.0	767	38.6
20	103.6	541	29.7	146.2	886	43.3
21	26.1	146	7.9	37.7	241	11.7

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

## **4. Revenue Impacts**

### **4.1. Direct Revenues**

Table 6A reports taxes paid directly by the Rosemont Copper Project. Total Arizona state and local taxes paid over the lifetime of the project are projected to \$809 million. Most important are state income taxes, at a projected \$541 million, followed by property taxes at \$152 million.

Public service delivery at the state and local level is driven by population. To appreciate the role Rosemont Copper Project will play in paying for these services, it is useful to compare Rosemont Copper Project projected tax payments per employee with the statewide ratio of total business taxes to employment. The state and local taxes projected to be paid by Rosemont Copper Project will amount to \$85,764 per employee. Estimates of total business taxes paid in the state suggest that the average taxes paid by Arizona businesses are on the order of \$3,200 per worker. On this basis, in Arizona, Rosemont Copper Project will pay 26 times as much in taxes as the average Arizona business.

Table 6B compares data used by the Seidman Institute to data used in the analysis by Applied Economics; note that AE does not report state income and federal income taxes.

**Table 6A: Rosemont Copper Project –Direct Taxes**  
**Seidman Institute Data**  
(Millions 2011\$)

	Sales	Property	Severance	State Income	Federal Income	Total
Total	13.4	152.4	102.6	541.0	2,515.8	3,325.3
Annual Averag	4.5	7.2	5.1	26.9	125.2	157.1
Year						
Construction Phase						
PP3						
PP2	0.5	0.1				0.6
PP1	9.5	0.1				9.5
Production Phase						
1	3.4	0.1				3.5
2		8.0	5.7	2.5	11.5	27.6
3		8.0	5.1	28.2	131.0	172.3
4		8.0	3.3	18.5	86.1	116.0
5		8.0	3.3	18.1	84.2	113.6
6		8.0	2.1	11.5	53.5	75.1
7		8.0	5.1	28.4	132.0	173.5
8		8.0	5.7	31.6	147.0	192.3
9		8.0	6.0	33.0	153.4	200.4
10		8.0	6.1	34.0	157.9	206.0
11		8.0	6.1	33.8	157.1	205.0
12		8.0	5.2	28.5	132.7	174.4
13		8.0	4.0	22.0	102.3	136.3
14		8.0	5.2	29.0	134.6	176.8
15		8.0	5.9	32.6	151.6	198.1
16		8.0	5.9	32.7	151.9	198.5
17		8.0	5.7	31.4	145.9	190.9
18		8.0	6.4	35.1	163.4	212.8
19		8.0	6.4	35.2	163.5	213.0
20		8.0	5.5	30.4	141.4	185.3
21		0.1	4.0	22.0	102.2	128.2
Post-Production Phase						
22		0.1				0.1
23		0.1		2.7	12.6	15.3
24		0.1				0.1

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

**Table 6B: Rosemont Copper Project –Direct Taxes  
Applied Economics Data  
(Millions 2011\$)**

	Sales	Property	Severance	Total
Total	11.4	69.1	61.5	142.0
Annual Average*		3.6	2.9	6.2
Year				
Construction Phase				
PP3				
PP2	11.4			11.4
PP1				
Production Phase				
1		3.6	2.1	5.7
2		3.6	2.9	6.5
3		3.6	1.4	5.0
4		3.6	2.5	6.2
5		3.6	1.3	4.9
6		3.6	2.1	5.7
7		3.6	2.2	5.9
8		3.6	3.3	7.0
9		3.6	4.0	7.6
10		3.6	4.1	7.7
11		3.6	3.4	7.0
12		3.6	2.1	5.8
13		3.6	3.1	6.7
14		3.6	3.7	7.3
15		3.6	3.8	7.5
16		3.6	3.7	7.3
17		3.6	4.3	7.9
18		3.6	4.5	8.1
19		3.6	4.0	7.6
20			3.0	3.0
21			0.2	0.2

\*Annual average values for the production phase refer to years 1 -21 when full production activities will occur.

## 4.2. Indirect Revenues

Table 7A presents Seidman Institute's estimates of the total impact of Rosemont Copper Project operations on state and local tax revenues. These figures encompass all of the taxes generated throughout the economic impact process, including taxes associated with the incomes and spending of Rosemont Copper Project employees and the taxes generated when suppliers produce goods and services for use in Rosemont Copper Project operations.

The total tax impact of the company at the state and local level is estimated to be \$48 million annually, resulting in \$1 billion over the life of the mine.

At the local level, SI estimates that total indirect taxes paid by employees will total \$41 million over the life of the mine (taxes at the local level are not reported separately in Table 7A), with an annual average of \$2 million. Local taxes generated by vendor purchases will total \$56 million over the life of the mine, with an annual average of approximately \$2 million.

Table 7B displays results reported by Applied Economics; note that AE only calculates indirect taxes paid by Rosemont Copper Project employees. Applied Economics' estimates are somewhat higher than SI's results -an average of \$5 million versus \$4 million in taxes paid by employees at the state and local level. At the local level, SI's annual estimates are also lower, at \$2 million compared to \$3 million.

**Table 7A: Rosemont Copper Project –Impact on State and Local Tax Revenues  
Arizona  
Seidman Institute Results  
(Millions 2011\$)**

	Direct Tax Payments	Paid by Employees	Vendor Purchases	Total
Total	809.4	95.7	130.0	1,035.2
Annual Average*	37.9	4.3	5.4	47.7
Year				
Construction Phase				
PP3			0.3	0.3
PP2	0.6	1.1	4.4	6.1
PP1	9.5	2.9	9.9	22.3
Production Phase				
1	3.5	4.4	5.9	13.8
2	16.2	4.6	6.9	27.7
3	41.3	4.7	6.0	51.9
4	29.9	4.6	5.2	39.7
5	29.4	4.7	6.5	40.6
6	21.6	4.8	7.1	33.5
7	41.5	4.7	6.5	52.7
8	45.3	4.6	4.9	54.8
9	47.0	4.5	5.9	57.4
10	48.1	4.4	6.2	58.8
11	47.9	4.5	7.5	60.0
12	41.7	4.7	6.7	53.1
13	34.0	4.6	6.1	44.7
14	42.2	4.6	5.9	52.6
15	46.5	4.5	5.7	56.7
16	46.6	4.3	4.9	55.7
17	45.0	3.9	3.9	52.9
18	49.5	3.4	3.1	56.0
19	49.5	3.4	3.6	56.5
20	43.9	3.4	2.7	50.0
21	26.0	3.4	2.6	32.0
Post-Production Phase				
22	0.1	0.4	1.0	1.5
23	2.8	0.2	0.3	3.3
24	0.1	0.2	0.3	0.6

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

**Table 7B: Rosemont Copper Project –Indirect Impacts on State and Local Tax Revenue**  
**Employee Impacts**  
**Applied Economic Results**  
(Millions 2011\$)

	City & County	State	Total
Total	73.0	39	111.7
Annual Average*	3.4	1.8	5.1
Year			
Construction Phase			
PP3			
PP2	0.5	0.3	0.8
PP1	1.6	1.2	2.8
Production Phase			
1	3.1	1.8	4.9
2	3.6	1.9	5.5
3	3.7	2.0	5.6
4	3.7	2.0	5.6
5	4.2	2.1	6.3
6	4.0	2.0	6.0
7	3.6	1.9	5.6
8	3.6	1.9	5.5
9	3.8	2.0	5.8
10	3.5	1.9	5.3
11	4.1	2.1	6.2
12	3.9	2.0	5.9
13	3.8	2.0	5.8
14	3.7	2.0	5.7
15	3.5	1.9	5.4
16	3.2	1.6	4.8
17	2.8	1.5	4.3
18	2.7	1.5	4.2
19	2.5	1.4	4.0
20	2.8	1.5	4.2
21	1.2	0.3	1.5

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

Table 8A displays indirect tax effects of the local share of the taxes- these are estimates of the economic impacts generated when the total (direct and indirect) tax revenues are



spent by local governments. The spending of these tax dollars will be responsible for generating annually an output of \$19 million, 236 jobs, \$12 million in labor income and \$15 million gross regional product. Over the life of the mine, this tax spending will be responsible for \$440 million in output, 5,572 person-years of employment, \$281 million in labor income, and \$360 million of gross regional product.

Applied Economics does not calculate such indirect impacts separately. However the Seidman Institute considers that the recycling of tax revenue is part and should be included in calculating the economic impact of an establishment. It may be that Applied Economics used “full SAM” multipliers and such effects are accounted for since full SAM multipliers provide for a re-cycling of both federal and state & local revenues. The Seidman Institute uses SAM multipliers without including federal, state and local revenue recycling, and performs these calculations outside of IMPLAN based on more detailed and specific data relating to Pima County rather than more generic methodology incorporated in the IMPLAN model. See more about this methodology in appendix TA.4.

## **5. Total Impacts**

Table 9A provides a summary of the total economic impact of the Rosemont Copper Project on Pima County.

Total economic impact are the sum of total effects from Rosemont Copper Project’s direct operations, total effects from supplier purchases, total effects from consumer spending by Rosemont Copper Project employees and effects from spending out of new state and local tax revenues. Table 9B displays total economic impacts reported by Applied Economics. Overall, Applied Economics’ results are somewhat smaller, and are discussed more in depth in Section 6.

**Table 8A: Rosemont Copper Project –Indirect Impacts of Tax Revenue  
Pima County  
Seidman Institute Results  
(Millions 2011\$)**

	Output	Jobs	Labor Income	Gross Regional Product
Total	440.2	5,572	280.8	360.1
Annual Average*	18.6	236	11.9	15.2
Year				
Construction Phase				
PP3	0.2	2	0.1	0.2
PP2	26.1	330	16.6	21.3
PP1	20.9	264	13.3	17.1
Production Phase				
1	11.9	151	7.6	9.8
2	20.9	265	13.3	17.1
3	20.3	256	12.9	16.6
4	19.6	249	12.5	16.1
5	20.7	262	13.2	16.9
6	21.2	268	13.5	17.3
7	20.7	262	13.2	16.9
8	19.4	245	12.4	15.9
9	20.1	255	12.8	16.5
10	20.3	257	12.9	16.6
11	21.3	270	13.6	17.4
12	20.8	263	13.3	17.0
13	20.3	257	13.0	16.6
14	20.1	254	12.8	16.4
15	19.9	252	12.7	16.3
16	19.2	242	12.2	15.7
17	18.1	229	11.6	14.8
18	17.2	217	11.0	14.0
19	17.5	222	11.2	14.3
20	16.8	213	10.7	13.8
21	4.6	58	2.9	3.7
Post-Production Phase				
22	1.1	15	0.7	0.9
23	0.5	6	0.3	0.4
24	0.5	6	0.3	0.4

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

**Table 9A: Rosemont Copper Project –Total Economic Impacts  
Pima County  
Seidman Institute Results  
(Millions 2011\$)**

	Output	Jobs	Labor Income	Gross Regional Product
Total	20,511.1	41,501	2,304.1	5,907.5
Annual Average*	922.9	1,784	99.9	260.2
Year				
Construction Phase				
PP3	9.9	43	2.1	3.2
PP2	156.0	1,232	62.2	122.8
PP1	383.0	2,409	119.9	259.3
Production Phase				
1	217.0	1,798	99.6	265.6
2	436.8	2,137	117.5	291.6
3	1,214.9	1,942	108.8	283.2
4	1,138.0	1,805	102.0	271.5
5	1,011.5	2,051	114.1	291.8
6	1,029.1	2,175	120.2	300.9
7	921.1	2,063	114.7	290.5
8	989.6	1,745	98.8	264.5
9	1,006.3	1,918	107.2	275.8
10	1,036.1	1,963	109.0	276.1
11	1,077.1	2,218	121.6	296.8
12	1,080.1	2,075	114.8	291.8
13	964.0	1,968	109.5	282.2
14	845.9	1,907	106.5	276.3
15	950.8	1,870	104.5	271.7
16	987.6	1,690	95.2	252.8
17	949.6	1,453	82.6	223.5
18	881.0	1,233	71.2	194.0
19	925.7	1,323	75.6	199.2
20	910.2	1,150	67.1	188.1
21	808.4	978	58.4	175.4
Post-Production Phase				
22	564.3	181	10.8	31.1
23	9.0	90	5.3	14.2
24	8.2	85	5.0	13.7

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

**Table 9B: Rosemont Copper Project –Total Economic Impacts  
Pima County  
Applied Economics Results  
(Millions 2011\$)**

	Output	Jobs	Labor Income
Total	9,372.4	36,645	1,796.6
Annual Average*	439.3	1,694	83.2
Year			
Construction Phase			
PP3			
PP2	22.1	275	10.0
PP1	124.8	792	40.5
Production Phase			
1	407.0	1,572	79.0
2	485.9	1,781	88.8
3	482.7	1,849	91.9
4	489.7	1,839	91.5
5	544.7	2,115	103.3
6	520.5	1,983	97.7
7	484.2	1,820	90.6
8	473.8	1,784	88.9
9	488.6	1,903	93.5
10	452.1	1,737	86.1
11	522.4	2,083	100.9
12	484.5	1,977	96.0
13	483.9	1,930	94.2
14	471.0	1,863	91.0
15	444.6	1,754	86.0
16	420.3	1,586	77.8
17	382.6	1,379	69.2
18	379.6	1,358	68.3
19	352.4	1,257	63.9
20	366.9	1,377	68.8
21	88.0	631	18.9

\*Annual average values for the production phase refer to years 1 - 21 when full production activities will occur.

The total impact of Rosemont Copper Project operations over the life of the mine is estimated at \$20.5 billion in output, 41,501 person-years of employment, labor income of \$2.3 billion and gross regional product of \$5.9 billion. On an annual basis, these numbers translate into \$923 million in output, 1,784 jobs, \$100 million in labor income and \$260 million in gross regional product. For perspective, the annual employment impact is 0.4 percent of total Pima County employment and the annual gross regional product figure is 0.7 percent of Pima County's gross regional product.

## **6. Conclusions and Comparison with other Economic Impact Reports- Applied Economics, Forest Service and Seidman Institute**

Table 10 shows the input data used by each report; note that the Forest Service report had the same input data as Applied Economics. Production costs, number of employees and their wages and salaries were provided by Rosemont Copper; however, Seidman Institute's data are more recent (obtained in early 2012) and differs from the earlier data.

Data used by the Seidman Institute, based on annual averages during the main production period, are 1.5 times higher than data used by previous studies in terms of production costs, approximately the same in terms of jobs and 1.1 times higher in terms of wage and salary payments.

Total vendor purchases were also provided by Rosemont Copper. However, only purchases made from local, Pima County vendors are of interest as purchases from outside the area do not cause local economic impacts- these shares were calculated by the authors of each study.

Figures reported by Seidman Institute as vendor purchases are based on inputs from Rosemont Copper and the authors' professional judgment. These numbers are somewhat lower - SI's numbers equal .7 of AE's annual averages and .8 of AE's totals over the life of the project.

**Table 10: Rosemont Copper Project  
Comparison of Production Phase Input Data  
Applied Economics and Seidman Institute  
Pima County  
(Millions 2011\$)**

	Production Costs		Jobs		Wages & Salaries		Vendor Purchases	
	Seidman Institute	Applied Economics	Seidman Institute	Applied Economics	Seidman Institute	Applied Economics	Seidman Institute	Applied Economics
Total	8,445.3	4,988.0	9,963	9,678	605.6	535.9	2,256.0	2,668.7
Annual Average	346.0	234.4	443	434	27.4	24.2	90.0	125.5
<b>Ratio SI/AE</b>								
Total		1.69		1.03		1.13		0.85
Annual Average		1.48		1.02		1.13		0.72

Table 11 displays a side-by-side comparison between Seidman Institute’s results and those obtained by Applied Economics in terms of economic variables reported by Applied Economics (SI reports gross regional product in addition to AE’s results). SI’s estimated output impacts are higher (2.2 times higher as totals and 2.1 times higher in terms of annual results), but not proportionally as high as the differences between the production costs input data would suggest at first sight. Output impacts are driven by both direct production costs (higher for SI), employee spending (slightly higher for SI) as well as supplier purchases (lower for SI); also, the specific industrial sectors to which purchases from vendors are assigned can drive the results up or down (for an in-depth explanation of this topic, see the Forest Service study as well as section TA3). In this context, Seidman Institute’s results appear to be within a reasonable range.

SI’s employment impacts are slightly higher: approximately 1.1 times higher measured as both totals and annual averages. There were just slight differences in the input data used by SI compared to AE’s input data, which is consistent with the small differences in results.

SI’s labor income effects are higher than AE’s: 1.3 times higher when comparing totals and 1.2 times higher when comparing annual averages. Seidman Institutes’ input data on wage and salary payments were also higher.

**Table 11: Rosemont Copper Project –Total Economic Impacts  
Comparison of Input Data and Results  
Applied Economics and Seidman Institute  
Pima County  
(Millions 2011\$)**

	Output		Jobs		Labor Income	
	Seidman Institute	Applied Economics	Seidman Institute	Applied Economics	Seidman Institute	Applied Economics
Total	20,511.1	9,372.4	41,501	36,645	2,304.1	1,796.6
Annual Average	922.9	439.3	1,784	1,694	99.9	83.2
<b>Ratio SI/AE</b>						
Total		2.19		1.13		1.28
Annual Average		2.10		1.05		1.20

Table 12 is provided to show the range of jobs and labor income estimates in a format comparable to the Forest Service report. This provides the range of employment and labor income impacts obtained by the three reports for the main production phase, all a function of the data provided by the client and the analysts' assumptions, without either being more "correct" than the others.

**Table 12: Rosemont Copper Project –Total Economic Impacts  
Comparison of Input Data and Results; Production Phase  
Applied Economics, Forest Services and Seidman Institute  
Pima County  
(Millions 2011\$)**

	Jobs			Labor Income		
	Applied Economics	Forest Services	Seidman Institute	Applied Economics	Forest Services	Seidman Institute
Direct	434	434	443	24.2	30.1	36.0
Indirect	1,094	265	779	52.9	17.6	44.2
Induced*	166	247	562	6.2	9.3	19.7
Total**	1,694	946	1,784	83.2	57.1	99.9

\*Note that the SI report does not report induced effects separately; rather, SI includes them with indirect effects

\*\*Numbers may not add up due to rounding

Construction phase input data is approximately the same for both the Seidman Institute study (\$913 million) and the Applied Economics and Forest Service reports (\$932 million). However the estimates of local shares differ, resulting in local expenditures of \$576 million in the Seidman Institute report and \$271 million in the AE report. Estimates of total economic impacts of the construction phase also differ, and are, as expected, higher in SI's report- 1.7 times higher in terms of output than in the AE report, 2 times higher in terms of jobs, and 1.9 times higher in terms of labor income than the AE report. Compared to the FS report, SI's results are 1.7 higher in terms of jobs, and 1.5 times higher in terms of labor income. The difference in local input data as well as choosing different industrial sectors can explain these differences.

Other potential causes for differences could be using different types of multipliers since IMPLAN allows a choice between several alternative specifications of the SAM (Social Accounting Matrices) multipliers.

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<http://www.rosemontcopper.com/mpo.html>

U.S. Census Bureau, *State and Local Government Finances, FY 2009*,  
<http://www.census.gov/govs/estimate/>

## **Technical Appendix: Data and Economic Impact Methodology**

### *TA.1 Employment and Payroll*

Rosemont Copper Project provided a file containing total annual wage and salary payments, benefits, and employment for the construction, production, and post-production periods. The average Rosemont Copper Project worker receives health and retirement and government social insurance benefits equal to 32 percent of wages and salaries. Rosemont Copper Project also provided detailed production costs, capital expenditures, and taxes and fees paid to federal, state and local governments. Data were for the construction years (referred to as PP3, PP2, and PP1) and the production and post-production years (years 1-24).

### *TA.2 Consumer Spending*

In economic impact analysis, estimates are made of the indirect effects (economic impacts generated by consumer spending are frequently referred to as induced effects) of a company's payroll that are generated when employees spend a portion of their incomes on goods and services produced within the local economy. Based on information in the Bureau of Labor Statistics' annual Consumer Expenditure Survey (CES), the Seidman Institute assumes that 85 percent of the money income of Rosemont Copper Project employees is spent on consumption. The detailed commodity make-up of these expenditures is based on data from the CES on the spending patterns of households with incomes between \$50,000-\$75,000.

### *TA.3 Vendor Purchases*

Companies make significant contributions to the local economy through their purchases of goods and services from local suppliers. Rosemont Copper Project provided a file containing projected vendor purchases for the duration of the project. These purchases were by broad categories such as electricity, diesel fuel, processing and mining supplies, equipment repair, etc. It was also specified in the file which purchases were to be made

locally, in-state or out of state. For the purpose of this study, only Pima County vendors are of interest.

To incorporate this information into IMPLAN, it is necessary to assign a detailed industry code to each transaction indicating the nature of the good or service being purchased and produced. This requires professional judgment and there is not one single “right” way to do it. Using different industry codes changes the magnitude of economic impacts, which explains the differences in results obtained by Seidman Institute’s report compared to the Applied Economics and Forest Service reports.

The Seidman Institute assigned NAICS (North American Industry Classification) codes to each vendor transaction category, based on professional judgment as well as being consistent with the parallel study the Seidman Institute is doing using the REMI software, which also requires a similar procedure. In most cases there were several (2-3) corresponding NAICS codes to choose from for each transaction category. After choosing a NAICS code, it was linked with an IMPLAN code using a correspondence table provided by the IMPLAN group.

To correctly assess the amount of vendor purchases, certain adjustment needed to be made for vendor payments for equipment produced out of state (the Seidman Institute assumed, like the Forest Service study, that plant equipment is purchased from local distributors and is not manufactured locally). For every dollar spent on equipment from wholesalers, local business owners and employees receive only 15¢. This figure is based on IMPLAN’s production functions.

#### *TA.4 Estimating Tax Revenues*

One of the objectives of this report was to estimate the total impact of Rosemont Copper Project operations on Pima County local tax revenues. Rosemont Copper Project provided information on the taxes paid directly by the company – severance, property, sales, state income as well as federal income taxes. While Rosemont Copper provided data related to direct tax payments, it is a difficult task to estimate the taxes paid by Rosemont Copper Project employees and any of the other taxes connected with the economic impact process. Many important taxes are local – for example, the property

taxes paid to school districts or sales taxes paid to cities. In theory, to estimate these, one would need to have and utilize information with a high degree of geographic granularity on the incomes and spending of employees, suppliers and anyone else connected with the multiplier process. Such an analysis is beyond the scope of this project.

To make the calculations meaningful, yet manageable, tax revenues generated at any phase of the economic impact process (apart from the business taxes paid directly by Rosemont Copper Project) were estimated by multiplying the income attributable to production in that phase by the economy-wide ratio of local taxes to gross state product. The most recent year for which this data is available from the U.S. Census Bureau is Fiscal Year 2009. In that year, local taxes in Arizona represented 3.6 percent of gross state product. In other words, on average, income generated from production in Arizona was taxed by local governments at a rate of 3.6 percent. With this figure in mind, taxes connected with the income earned and spent by Rosemont Copper Project employees was estimated by taking 3.6 percent of their labor income. Taxes associated with the production of goods and services that Rosemont Copper Project purchased from Arizona suppliers were estimated by taking 3.6 percent of the income generated from that production. Taxes associated with the multiplier process were also estimated in this way.

#### *TA.5 About the IMPLAN model*

IMPLAN is maintained and licensed by the Minnesota IMPLAN Group, Inc. (MIG). The IMPLAN model organizes the economy into 440 separate industries and has comprehensive data on every area of the United States; it is widely used by economists to assess impacts of economic activities on the local economy. Version 3.0 of the software was used.

The specific model used in this report was based on IMPLAN's 2009 economic database for Pima County, Arizona. In addition to providing estimates of multiplier effects, IMPLAN has a detailed database which makes it possible to estimate the direct jobs and incomes associated with any given dollar amount of vendor purchases.

Type SAM (Social Accounting Matrix) multipliers were used with the amount of recycled spending limited to private sector spending. State and local tax revenues generated during the economic impact process also were assumed to be spent, but these calculations were performed outside of IMPLAN.