



Sandia National Laboratories

Economic Impact on California and the San Francisco Bay Area

July 2011



Prepared by:
Center for Economic Development
California State University, Chico
Chico, CA 95929-0765
530-898-4598
www.cedcal.com



Table of Contents

Executive Summary Page 1

Introduction

Purpose of the Study Page 2

Background Page 2

Summary of Methodology Page 4

Results

Economic Impact: California..... Page 8

Economic Impact: San Francisco Bay Area Page 11

Conclusion Page 12

References Page 13

Appendices

Appendix A: Setting up the Economic Models Page 14

Appendix B: Calculating the Fiscal Impact on California’s Major Sources of General
Fund Revenues Page 16

List of Tables

Table 1 - Spending Patterns of Sandia National Laboratories, Fiscal year 2010
(ending 9/30/10)..... Page 3

Table 2 - Direct Economic Impact of Sandia by State Page 6

Table 3 - Direct Economic Impact of Sandia by Analysis Region..... Page 8

Table 4 - Financial Impact on California Businesses and Organizations..... Page 9

Table 5 - Impact on California Households: Income and Jobs Page 9

Table 6 - Fiscal Impact on California State Budget: Selected Major General Fund
Categories Page 10

Table 7 - Financial Impact on Bay Area Businesses and Organizations Page 11

Table 8 - Impact on Bay Area Households: Income and Jobs Page 12

Executive Summary

Sandia National Laboratories is a significant economic engine for the state of California. The organization's activities are responsible for generating nearly one billion dollars in economic output within the state. Economic output is defined here as revenue to all private businesses and public organizations.

Sandia directly spends \$154.6 million in employee compensation (including fringe benefits and payroll-related taxes), \$1.4 million in state corporate tax, and \$162.9 million in purchases and contracts to California businesses. The total direct injection to the California economy is the sum of these three components, or \$319.0 million. As these dollars are respent in California's well-developed economy, they generate total revenue to businesses and organizations nearly three times the amount of the direct spending. The indirect impacts of Sandia's spending are responsible for an additional \$25.3 million in revenue to California's state government and \$635.9 million in additional revenue to other businesses and organizations in the state. This all adds up to a total output impact that approaches one billion dollars (\$954.9 million).

The total financial benefit to California households, or household income, is \$496.8 million. This includes direct employee compensation plus \$342.1 million in payroll, self-employment, and other household income paid by other California businesses and organizations. The household income benefit supports more than 4,800 California jobs.

About half of the economic impact on California of Sandia National Laboratories occurs in the San Francisco Bay Area. The Bay Area's share of the total economic impact is \$474.3 in economic output (total revenues to businesses and organizations), \$304.4 million in household income, and more than 2,500 jobs.

These financial impacts do not include other non-quantifiable benefits to the California economy, including spin-off companies or additional sales that result from businesses using Sandia's research and testing facilities. These impacts are potentially significant, but could not be quantified for this report.

Introduction

Purpose of the Study

The purpose of this study is to quantify the direct and indirect economic impact of Sandia National Laboratories on the state of California and its economy, as well as the economy of the San Francisco Bay Area. Specifically, the study investigates how Sandia’s presence contributes to the overall economy of California, how Sandia benefits residents through increased household income, and how the organization contributes to the state budget.

The economic impact of Sandia National Laboratories on the California economy is the sum of direct and secondary spending (responding of direct dollars entering the economy) that occurs within the state’s borders because of Sandia’s employee compensation and taxes at its Livermore location, plus payments to contractors located in California and its neighboring states.

Background

Sandia National Laboratories is a federal government-owned, contractor-operated scientific research, development, and engineering laboratory. Economists and industry analysts refer to federal government-owned organizations as a “federal government enterprise.” Since 1949, technology solutions developed and tested at Sandia’s facilities have solved national and global threats to peace and freedom. Applications of work at Sandia focus on areas including security and reliability of the nation’s weapons systems and stockpile, energy delivery and security, and national security threat detection and forecasting systems.

Generally, the workforce at Sandia is highly trained and educated. About half are technical staff, including engineers and scientists. This staff includes mostly persons with a Master’s or PhD, and includes many interns and post-doctoral researchers. The remaining staff are mostly technical and administrative support.

According to their Web-site, Sandia’s mission is to meet national needs in five key areas:

- Nuclear weapons – ensuring the stockpile is safe, secure, and can support the United States’ deterrence policy
- Energy and infrastructure assurance – enhancing the surety of energy and other critical resources

- Nonproliferation – reducing the proliferation of weapons of mass destruction, and enhancing the surety of critical infrastructures
- Defense systems and assessments – addressing new threats to national security
- Homeland security and defense – helping to protect our nation against terrorism

Customers and project sponsors include many federal government agencies, especially the Department of Energy, Department of Defense, and the Department of Homeland Security. Sandia also conducts scientific and engineering work on behalf of its sponsors/customers from private industry.

Sandia has a major research and engineering establishment located in Livermore, California, in the San Francisco Bay Area. Through employee compensation and business spending at this establishment, plus corporate contracting with other California businesses, Sandia injects a significant amount of money into the California economy each year. Sandia provided the following spending information to the Center for Economic Development for the purpose of this study, which CED converted to employee compensation (including fringe benefits and payroll-related taxes), business-to-business spending, and total taxes for use in an economic impact model.

- \$162.8 million in labor and non-contract related payments
- \$13.8 million in procurement card purchases from its staff
- \$1.4 million in corporate taxes
- \$141.0 million in contract-related payments to California companies

In total, Sandia spends a total of \$319.0 million directly in California. Sandia also spends over \$50 million in contract-related payments to companies located in neighboring states. Table 1 contains expenditure data for Sandia National Laboratories: nationally, in California, and in neighboring states.



Table 1 - Spending Patterns of Sandia National Laboratories, Fiscal year 2010 (ending 9/30/10)

Organization	Total	California	Nevada	Arizona	Oregon	Hawaii
Labor and Non-Contract Related Payments	\$ 1,273,945,000	\$ 162,760,573	n/a	n/a	n/a	n/a
Procurement Card Purchases	\$ 65,650,000	\$ 13,756,703	n/a	n/a	n/a	n/a
Corporate Tax (to states)	\$ 69,300,300	\$ 1,415,200	n/a	n/a	n/a	n/a
Contract-Related Payments	\$ 950,093,000	\$ 141,047,282	\$ 25,913,680	\$ 13,023,965	\$ 12,578,178	\$ 1,009,166
Total Sandia Expenditures	\$ 2,358,679,003	\$ 318,979,758	\$ 25,913,680	\$ 13,023,965	\$ 12,578,178	\$ 1,009,166

Source: Sandia National Laboratories

These financial impacts do not include other non-quantifiable benefits to the California economy, including spin-off companies or additional sales that result from businesses using Sandia’s research and testing facilities. These impacts are potentially significant, but could not be quantified for this report.

Summary of Methodology

CED utilized the IMPLAN economic impact analysis system to estimate the overall impact to all California businesses, organizations, and households of Sandia spending in California and neighboring states.

About Economic Impact Analysis

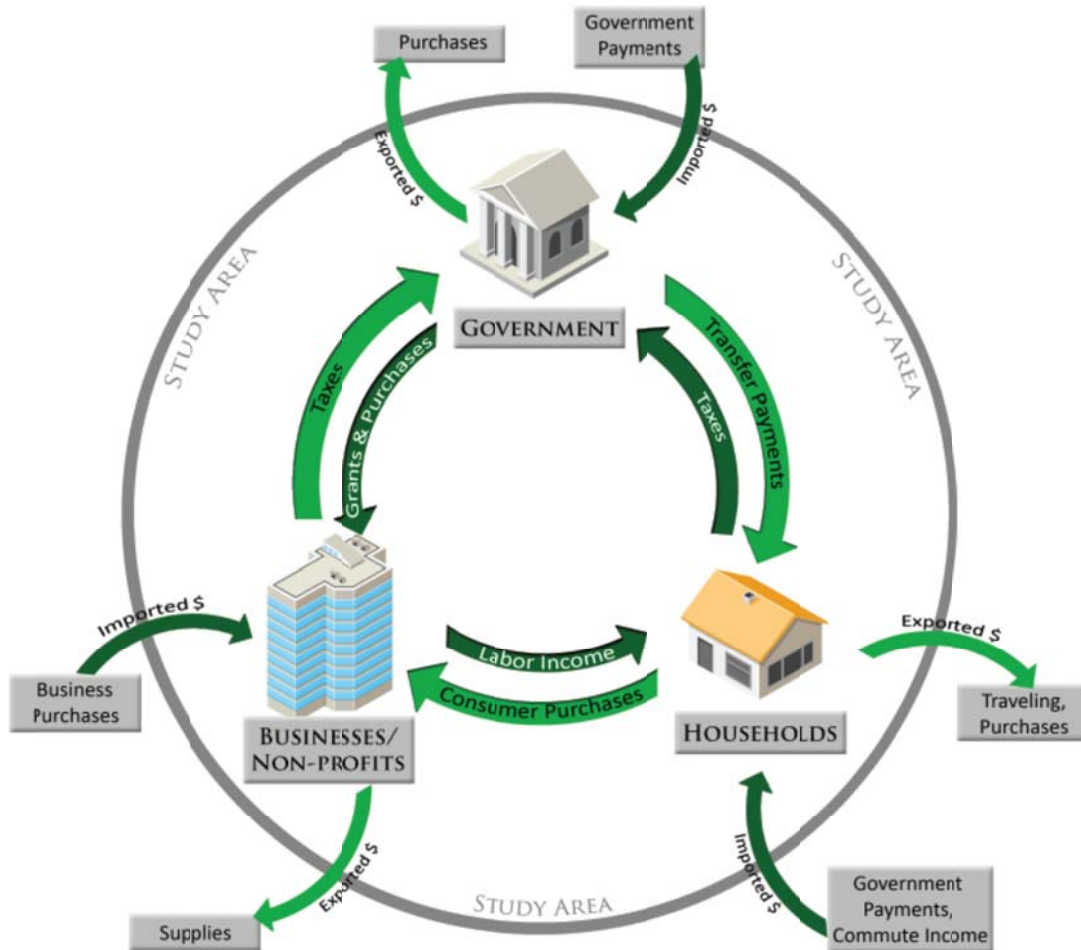
Economic impact analysis is an estimate of how a direct economic contribution (or loss) reverberates throughout a specific geographical study area. The idea is that dollars spent in an area can be re-spent several times, resulting in revenue and income to others in the community. CED utilized IMPLAN 3.0 to conduct the economic impact analysis, which allows the creation of multi-region economic models to estimate how dollar flows in other regions benefit organizations and households in the study area.

Figure 1 is a diorama showing how IMPLAN models dollar flows in a geographical study area. Generally, dollars flow between households, businesses and nonprofits, and governmental organizations, usually through purchases, labor compensation, and taxes. There are also significant amounts of money entering and leaving the study area in the form of income spent

outside the service area (vacations, long distance shopping trips, etc.), business purchases outside of the area, and federal taxes and government payments. A dollar present in the study area is transferred between households, businesses/non-profits, and government before it is spent outside of the area. The economic impact is the aggregate amount of times those dollars flow to these households and organizations.

The model represented by Figure 1 is a simplistic representation of the actual IMPLAN modeling system. In reality, IMPLAN models dollar flows between 425 different private industry classifications, 10 sectors representing different household demographic compositions, 16 sectors for government administration and enterprises, and 2 sectors representing foreign and domestic trade. IMPLAN also includes provisions for unique dollar flows of loan capital and adjustments for inventory changes and depreciation. Therefore, IMPLAN builds a complex economic model that represents how dollars flow into, out of, and through a local economy.

Figure 1 – Conceptual Economic Impact Analysis Model



Note: Green arrows represent dollar flows

Setting Up the Economic Model

CED’s first task was to separate employee compensation from other purchases, including contracting. In IMPLAN, “employee compensation” includes wages and salaries, fringe benefits, and payroll-related taxes.¹ Through consultation with Sandia staff, the CED found that at least 94 percent of the “labor and non-contract related payments” category was for employee compensation. The CED assumed this percentage to be equal 95 percent for the purpose of this analysis. Corporate tax payments to California, totaling \$1.4 million in fiscal year 2010, were separated out. The remainder of labor and non-contract related payments, procurement card

¹ Because employee compensation includes much more than direct wages and salaries earned, this figure cannot be used to calculate average pay.



purchases, and contract-related payments were summed as payments to businesses and other organizations. All of these calculations are shown in Table 2, separated out by state.

Table 2 - Direct Economic Impact of Sandia by State

Organization	California	Nevada	Arizona	Oregon	Hawaii
Employee compensation ¹ (95% of Labor and Non-Contract Related Payments)	\$ 154,622,544	\$ 0	\$ 0	\$ 0	\$ 0
Payments to California State Government	\$ 1,415,200	\$ 0	\$ 0	\$ 0	\$ 0
Payments to Businesses and Other Organizations (All Other Payments)	\$ 162,924,014	\$ 25,913,680	\$ 13,023,965	\$ 12,578,178	\$ 1,009,166
Total Sandia Expenditures	\$ 318,979,758	\$ 25,913,680	\$ 13,023,965	\$ 12,578,178	\$ 1,009,166

¹Includes wages and salaries, fringe benefits, and payroll-related taxes. IMPLAN combines these items into one spending category because they are all employee-related, and therefore the total represents the business cost of labor. Employee take-home pay is only a portion of this amount.

A process was required to get IMPLAN to correctly model Sandia’s spending. Typically, IMPLAN is used to model spending from an organization, assuming the organization spending patterns behave like the average spending patterns for the organization’s industry. However, Sandia National Laboratories is a large organization with a spending pattern that was unlikely to match that of any predetermined industry. Because Sandia is legally a federal government enterprise, its spending pattern will be somewhat similar to other federal enterprises, but because this particular federal government enterprise is primarily engaged in scientific research and development, its spending will also be somewhat similar that of other scientific research and development organizations.

Typically, the CED responds by programming an organization’s spending pattern by industry directly into the IMPLAN economic model. However, Sandia’s actual spending could not be accurately categorized by industry, and spending by organization could not be made available for this analysis. Therefore, CED consulted with Sandia’s staff, which agreed that its business-to-business spending patterns are fairly close to 50% like those of scientific research and development organizations (IMPLAN sector 376) and 50% like those of other federal government enterprises (IMPLAN sector 429).

Setting Up the Study Areas

CED created five regions for analysis through IMPLAN: 1) the nine-county Bay Area, 2) the rest of California, 3) Arizona, 4) Nevada, and 5) Oregon (contracting to Hawaii companies was too

small to reliably estimate spillover impact in California). The extent of the San Francisco Bay Area is shown in Figure 2. The direct spending from Sandia National Laboratories in each of these five areas was entered into the model, assuming payments to businesses and other organizations (from Table 2) that was 50% from scientific research and development organizations and 50% from other federal government enterprises. The result of this calculation is shown in Table 3.

Figure 2 – Map of Study area and Location of Sandia National Laboratories





Table 3 - Direct Economic Impact of Sandia by Analysis Region

Organization	San Francisco Bay Area	Rest of California	Nevada	Arizona	Oregon
Employee compensation (incl. fringe benefits and payroll-related taxes)	\$ 154,622,544	\$ 0	\$ 0	\$ 0	\$ 0
Payments to California State Government	\$ 0	\$ 1,415,200	\$ 0	\$ 0	\$ 0
Payments to Businesses and Other Organizations (29.4% of California payments in the Bay Area)	\$ 47,908,125	\$ 115,033,889	\$ 25,913,680	\$ 13,023,965	\$ 12,578,178
Total Sandia Expenditures	\$ 202,530,669	\$ 116,449,089	\$ 25,913,680	\$ 13,023,965	\$ 12,578,178

CED set up each individual regional economic model so that direct impacts would match Sandia spending in each area. For details on how CED modified each model, see Appendix A.

Running the Economic Impact Models

CED built a five-region multiregional model, with the regions as: 1) the Bay Area, 2) the rest of the state, 3) Arizona, 4) Nevada, and 5) Oregon. CED entered the direct impact of Sandia National Laboratories in each region and ran the IMPLAN model.

Individually, the model’s analysis of direct impact in each of the five regions produced separate economic impacts in the Bay Area and the rest of the state. CED simply used the sum of each of the five Bay Area impacts as the total impact in the Bay Area. Likewise, CED used the sum of the five “rest of the state” economic impacts, plus the impact in the Bay Area, as the total economic impact in California.

Results

Economic Impact: California

The total output impact, that is, the impact on revenue to California businesses and organizations is \$954.9 million. Sandia National Laboratories directly spends \$319.0 million in



California on employee compensation, taxes, and business purchases.² Respending of those dollars in California produces an additional \$635.9 million in revenue to other California businesses and organizations.

Table 4 - Financial Impact on California Businesses and Organizations

Organization	Direct ¹	Secondary ²	Total Impact ³
Sandia National Laboratories (employee compensation portion, which includes fringe benefits and payroll-related taxes)	\$ 154,622,544	\$ 0	\$ 154,622,544
State Government General Fund ⁴	\$ 1,415,200	\$ 23,839,054	\$ 25,254,254
Other CA Businesses and Organizations	\$ 162,942,014	\$ 612,041,527	\$ 774,983,540
Total Output Impact	\$ 318,979,758	\$ 635,880,581	\$ 954,860,339

¹Paid directly by Sandia

²Aggregate dollar flows through all California businesses and organizations through spending and respending of dollars brought to California by Sandia

³Total Impact may not exactly equal the sum of direct and secondary impact due to independent rounding

⁴Includes major funding categories, only. For detail, see Table 6

California households benefitted from Sandia’s spending in California, as well, with additional income approaching \$500 million. Besides direct employee compensation and related payments of \$154.6 million, other California businesses and organizations earned enough revenue to pay their employees an additional \$187.6 million.³ Self employment, corporate profits, dividends payments, and payments from property rental add another \$154.6 million in income to California households, bringing the total household income impact to \$497.8 million. Employment income earned through direct and secondary spending supports more than 4,800 California jobs.

²Typically, output for the state and other organizations is considered part of the secondary impact. However, because Sandia pays corporate taxes and contractors through its corporate office, rather than through its California establishments, benefits to government and other businesses and organizations are considered direct impact in this analysis.

³ As indicated in footnote 2, output paid directly by Sandia is considered direct impact in this analysis. However, any employee compensation or other household income paid from this output is considered secondary impact.

Table 5 - Impact on California Households: Income and Jobs

Organization	Direct ¹	Secondary ²	Total Impact ³
Employee compensation (incl. fringe benefits and payroll-related taxes)	\$ 154,622,544	\$ 187,574,307	\$ 342,196,851
Other Household Income Earned ⁴	\$ 0	\$ 154,573,365	\$ 154,573,365
Total Household Income Earned	\$ 154,622,544	\$ 342,147,671	\$ 496,770,215
Jobs Impact ⁵	1,072	3,755	4,827

¹Paid directly by Sandia

²Aggregate dollar flows through all California businesses and organizations through spending and respending of dollars brought to California by Sandia

³Total Impact may not exactly equal the sum of direct and secondary impact due to independent rounding

⁴Mostly self-employment and property income

⁵Includes full-time, part-time, and seasonal jobs over the course of a year, which is higher than the number of employees at any point-in-time.

CED independently calculated the fiscal impact of Sandia spending on major categories of California’s general fund revenues. CED used the top four categories of general fund revenues; 1) income tax, 2) sales tax, 3) corporate profits and dividends tax, and 4) vehicle license fees (VLF). These categories comprise 95 percent of all state general fund revenues. For more detail about how CED calculated these impacts, see Appendix B.

Table 6 - Fiscal Impact on California State Budget: Selected Major General Fund Categories

Organization	Paid by Sandia	Paid by Households and other Bus./Orgs.	Total Impact
Income Tax (paid by employees or households)	\$ 0	\$ 14,435,302	\$ 14,435,302
Sales Tax (paid by California businesses)	\$ 0	\$ 7,037,560	\$ 7,037,560
Dividends/ Corporate Profit Tax (paid by Sandia and other CA corporations)	\$ 1,415,200	\$ 1,980,880	\$ 3,396,080
VLF (paid by employees or households)	\$ 0	\$ 385,312	\$ 385,312
Total (Major GF Categories)	\$ 1,415,200	\$ 23,839,054	\$ 25,254,254

The fiscal impact of Sandia on major sources of general fund revenue for the state of California is significant. Sandia’s spending in California is directly responsible for \$1.4 million in corporate



taxes, plus an additional \$23.8 million in income tax, sales tax, other dividends and corporate profit taxes, and vehicle license fees paid due to secondary business and household revenues. The fiscal impact on the top four California general fund categories is \$25.3 million.

Economic Impact: San Francisco Bay Area

Much of Sandia’s economic impact occurs in California’s San Francisco Bay Area region for two reasons. First, Sandia is located in the Bay Area and therefore, its employees spend much of their income in that area. Second, the Bay Area houses a regional technology and research cluster, so many of Sandia’s contractors are located in the Bay Area.

The total output impact (revenue to businesses and organizations in the Bay Area) of Sandia National Laboratories was \$474.3 million. This includes the direct impact on the Bay Area, which is the same as in the state. This is because Sandia is located in the Bay Area and the direct impact is assigned to the location of the establishment. Because Sandia’s contractor list was not available for this analysis, CED used the structural matrix from the IMPLAN model implying that 29.4 percent of general California business spending (using 50% from scientific research and development and 50% from other federal government enterprises) occurs directly to the Bay Area’s nine counties. Therefore, the direct output impact to other Bay Area businesses and organizations is \$47.9 million, making the total direct output impact \$202.5 million. Secondary spending in the Bay Area produced an additional \$271.8 million in business and organization revenue, for a total output impact of \$474.3 million.

Table 7 - Financial Impact on Bay Area Businesses and Organizations

Organization	Direct	Secondary ¹	Total Impact ²
Sandia National Laboratories (employee compensation portion, only)	\$ 154,622,544	\$ 0	\$ 154,622,544
Other Bay Area Businesses and Organizations (29.4% of California purchases)	\$ 47,908,125	\$ 271,767,347	\$ 319,675,472
Total Output Impact	\$ 202,530,669	\$ 271,767,347	\$ 474,298,017

¹Aggregate dollar flows through all California businesses and organizations through spending and respending of dollars brought to California by Sandia

²Total Impact may not exactly equal the sum of direct and secondary impact due to independent rounding



Looking at employee compensation and other household income in the IMPLAN model, a total of \$304.4 million flows through Bay Area households as a result of Sandia’s spending in California. This includes direct employee compensation because this is counted at the place of work, although it is possible that some employees commute from counties outside of the Bay Area. Employee compensation in the Bay Area is enough to support more than 2,500 Bay Area jobs.

Table 8 - Impact on Bay Area Households: Income and Jobs

Organization	Direct ¹	Secondary ²	Total Impact ³
Employee compensation (incl. fringe benefits and payroll-related taxes)	\$ 154,622,544	\$ 82,068,346	\$ 236,690,890
Other Household Income Earned ⁴	\$ 0	\$ 67,723,006	\$ 67,723,006
Total Household Income Earned	\$ 154,622,544	\$ 149,791,352	\$ 304,413,896
Jobs Impact ⁵	1,072	1,468	2,540

¹Paid directly by Sandia

²Aggregate dollar flows through all California businesses and organizations through spending and respending of dollars brought to California by Sandia

³Total Impact may not exactly equal the sum of direct and secondary impact due to independent rounding

⁴Mostly self-employment and property income

⁵Includes full-time, part-time, and seasonal jobs

Conclusion

Sandia National Laboratories provides a significant economic benefit to California and the San Francisco Bay Area. Directly, Sandia spends \$319.0 million in California. This spending is comprised of:

- \$162.8 million in labor and non-contract related payments
- \$13.8 million in procurement card purchases from its staff
- \$1.4 million in corporate taxes
- \$141.0 million in contract-related payments to California companies

California has a large, well-developed and well-connected economy, and therefore is able to capture a significant share of the secondary impact that results from the direct spending by Sandia. CED estimates Sandia's full economic impact on the state of California to be almost one billion dollars, or \$954.9 million in output (revenue to businesses and organizations). This impact includes a direct and secondary impact to the state of California's general fund of \$25.3 million. California households also benefit with \$496.8 million in income through employee compensation, self-employment, and property income. CED concludes that Sandia's spending in the state supports more than 4,800 California jobs.

About half of the economic impact of Sandia National Laboratories occurs in the San Francisco Bay Area. The Bay Area's share of the total economic impact of Sandia is \$474.3 million in output, \$304.4 million in household income, and more than 2,500 jobs.

References

Minnesota IMPLAN Group, Inc. (2011). *IMPLAN System V3 with 2009 Data*. Hudson, WI: MIG, Inc. www.implan.com

Minnesota IMPLAN Group, Inc. (2010). *Version 3.0 User's Guide*. Hudson, WI: MIG, Inc.

Sandia National Laboratories. (2011). About Sandia. Retrieved from <http://www.sandia.gov/about/index.html>

Appendix A: Setting up the Economic Models

In order to appropriately run Sandia’s spending through the IMPLAN economic model, CED was required to make several modifications to base IMPLAN model assumptions. A summary of these changes follow.

Setting Up the Bay Area Model

For the purpose of this analysis, the San Francisco Bay Area is defined as the nine-county Consolidated Metropolitan Statistical Area. The counties included are Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

The exact location of Sandia’s contractors is confidential. Therefore, CED used the IMPLAN model to determine how much, in general, California spending from the scientific research and development services and federal government enterprises industries goes directly to the Bay Area region. The IMPLAN model predicts that 29.4 percent of California spending from these industries goes directly to the Bay Area. If actual California spending of Sandia contracts is greater than this general percentage, that the actual economic impact of Sandia in the Bay Area will be greater than that shown in this analysis.

In order to set up in the IMPLAN model to accurately reflect Sandia’s spending, CED had to set direct trade (direct spending outside of the study area) to zero. We know from Sandia that the dollar amounts published for spending in California were spent in California, and so direct trade must be set to zero. In IMPLAN 3.0, a multi-regional model only works when economic models are built using IMPLAN’s proprietary trade flow modeling system. The challenge is that the trade flows in this model is set for commodities, rather than industries. In IMPLAN, commodities are products or services of industry that are sold, and one industry can produce many commodities.

In order to keep direct trade to zero, CED had set the commodity production for scientific research and development organizations to 100% “products and services of scientific research and development”. Likewise, CED set commodity production for other federal government enterprises to 100% “products of other federal government enterprises”. Then, CED set the regional trade flow for both “products and services of scientific research and development” and “products of other federal government enterprises” to 100% local purchases.

Interestingly, even after setting direct trade to zero, IMPLAN still showed some direct trade from both scientific research and development and federal government enterprises, although the

resulting trade amounts were far smaller than in an unmodified model. CED responded by adjusting direct employee compensation and output for both scientific research and development and federal government enterprises so that direct employee compensation would equal that from Sandia. All other value added components (proprietor income, corporate profits, and business taxes) were zero, and local business-to-business spending for scientific research and development and other federal government enterprises would both equal \$23,954,062.50 (\$47,908,125 divided equally in two).⁴

Setting Up the Rest of the State Model

The economic model for the rest of the state was comprised of the 49 California counties not in the San Francisco Bay Area. It was set up in a similar way to the Bay Area model, but with a couple of key differences.

Like the Bay Area model, CED set direct trade in scientific research and development services and other federal government enterprises to zero (100% of business purchases spent locally – since we know the amount spent on contracting and other business purchases, \$115,033,889, was all spent in California). Also, like in the Bay Area model, there was a small amount of direct trade left over that was later subtracted out of the results. The key differences were employee compensation set to zero and indirect business taxes set to equal \$1,415,200 in corporate taxes paid by Sandia.

Setting Up the Models for Arizona, Nevada, and Oregon

For the other states' models, CED again set direct trade in scientific research and development organizations and other federal government enterprises to zero (we know how much Sandia directly spends in these states, so there should be no direct regional trade from these industries), and all value added was also set to zero (no payroll or corporate taxes paid by Sandia). Direct values were entered into the scientific research and development and other federal government enterprises industries such that same-state spending was evenly distributed between the two industries, and their sum equaled the total value of Sandia's contract-related spending in each state.

⁴ Modifying the scientific research and development and the other federal government enterprises industries also affect IMPLAN's modeled spending for other businesses in this industry. In other words, the IMPLAN analysis will assume that not only are exports reduced at Sandia, but also reduced for all other businesses in these industries. However, the secondary impact of scientific research and development and other federal government enterprises add up to only \$859,697 in the Bay Area model, which is too small to make a significant difference in the final impact total.

Appendix B: Calculating the Fiscal Impact on California's Major Sources of General Fund Revenues

Public finance in California is the result of decades of ballot initiatives and budget deals. While other states may be in the same situation, the CED does not use IMPLAN's "national average" model to evaluate state or local government financial benefit from economic impacts in California. Rather, CED separates out general fund revenues – the type of revenue used to fund schools, public safety, and most administrative activities, and the type of revenue state administrators covet most – and evaluates major sources of general fund revenues separately. CED evaluates the fiscal benefit of major categories of general fund revenues based on the actual formulas used for determining tax liability.

For this analysis, conducted in spring 2011, CED used the top four categories of general fund revenues. These categories comprise 95 percent of all state general fund revenues.

The income tax impact is calculated as a percentage of total personal income. CED calculated total income taxes paid as a percentage of total personal income in the IMPLAN model. This percentage was multiplied by the total income impact of Sandia to estimate the state income tax impact.⁵

The sales tax impact is calculated independently for each of IMPLAN's 425 private industry sectors and aggregated into a total impact. Each sector's impact is calculated using actual sales tax collected from that sector, available from the California Board of Equalization, divided by total industry sales in IMPLAN. The output impact for each sector was multiplied by the sector's percentage of overall sales going to sales taxes.

Corporate profits and dividends taxes were calculated by taking actual taxes collected in California as a percentage of all corporate profit and dividends in IMPLAN. The total impact of Sandia on corporate profits and dividends (labeled "other property type income" in the IMPLAN model) was multiplied by this percentage for a total dividends and corporate profits impact. Note that this impact includes the \$1,415,200 in corporate taxes paid directly by Sandia.

⁵ This method may under-represent the actual income tax impact in California because California has a progressive income tax rate and Sandia National Laboratories pays its employees well above the average annual state wage in California.

Vehicle license fees (VLF) collected by California were taken as a percentage of all personal income in California, and then multiplied by the personal income impact of Sandia for an estimate of VLF revenue impact.

Other significant impacts may come from the insurance gross premiums tax or taxes on alcoholic beverages and cigarettes, although these estimates are less reliable and would account for less than 5 percent of the state's general fund revenue impact.