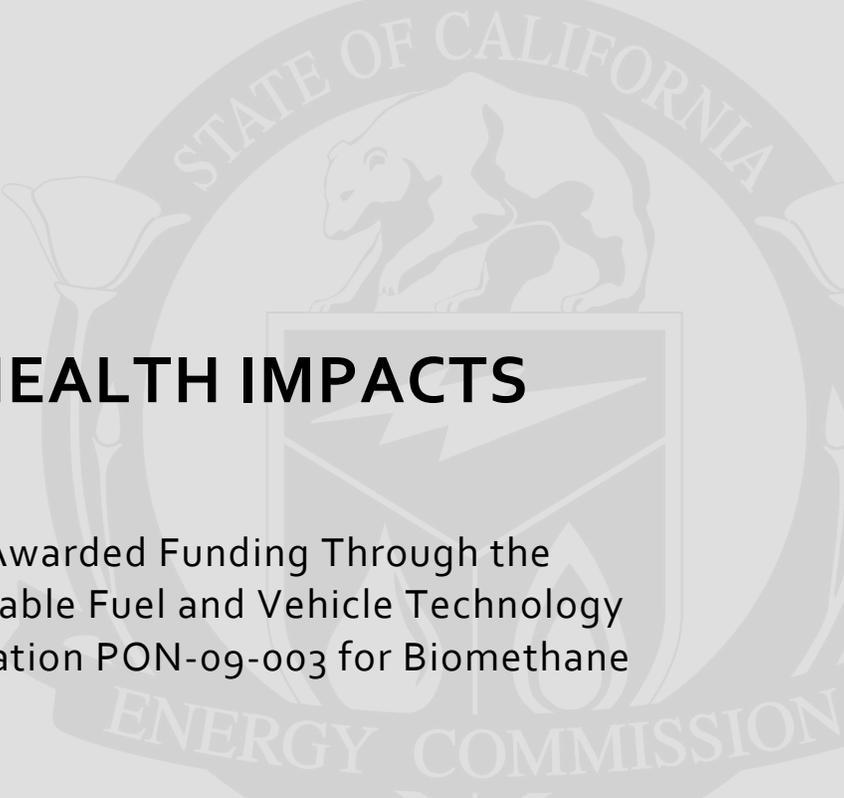


# California Energy Commission

## STAFF REPORT



### **LOCALIZED HEALTH IMPACTS REPORT**

For Selected Projects Awarded Funding Through the  
Alternative and Renewable Fuel and Vehicle Technology  
Program Under Solicitation PON-09-003 for Biomethane  
Production

MAY 2010

CEC-600-2010-004

# CALIFORNIA ENERGY COMMISSION

Aleecia Macias  
***Primary Author***

Rhetta deMesa  
***Project Manager***

Charles Mizutani  
***Office Manager***  
***Emerging Fuels and Technologies Office***

Michael A. Smith  
***Deputy Director***  
***Fuels and Transportation Division***

Melissa Jones  
***Executive Director***

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Jennifer Allen  
Gerry Bemis  
Matthew Layton  
Aleecia Macias  
Mike McCormack  
Jim McKinney  
Charles Mizutani  
Linda Schrupp  
Malachi Weng-Gutierrez  
Renee Webster-Hawkins

## PREFACE

The increased use of alternative and renewable fuels supports the state's commitment to curb greenhouse gas emissions, reduce petroleum use, improve air quality, and stimulate the sustainable production and use of biofuels within California. Alternative and renewable transportation fuels include electricity, natural gas, biomethane, propane, hydrogen, ethanol, renewable diesel, and biodiesel fuels. State investment is needed to fill the gap and fund the differential cost of these emerging fuels and vehicle technologies.

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Alternative and Renewable Fuel and Vehicle Technology Program (Program). This statute, amended by Assembly Bill 109 (Núñez, Chapter 313, Statutes of 2008) authorizes the California Energy Commission to "develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies." The Energy Commission has an annual program budget of approximately \$100 million.

The statute also directs the Air Resources Board to develop guidelines that apply to the program to ensure the programs complement efforts to improve air quality. The Air Quality Guidelines were approved in 2008. California Code of Regulations, Title 13, Chapter 8.1, Section 2343(c)(6) contains the requirement for the Energy Commission, being the funding agency, to analyze the localized health impacts of projects funded by the program that require a permit.

## ABSTRACT

California Code of Regulations, Title 13, Chapter 8.1, Section 2343(c)(6) requires the Energy Commission to consider the localized health impacts and environmental justice when selecting projects for funding. For each funding cycle, the Energy Commission is required to analyze localized health impacts for projects proposed for program funding that require a permit.

This report is a review of the projects submitted under the Biomethane Production grant solicitation and proposed for funding under the Alternative and Renewable Fuel and Vehicle Technology Program for Fiscal Year 2009/2010. The report includes a description of the projects, criteria emissions data for the fuels associated with the projects and demographic data for the areas where the projects will be located, and an analysis of the impacts of these projects in communities with the most significant exposure to air contaminants or localized air contaminants. Future editions of this report and its aggregate location analysis will include information about projects approved in previous funding cycles including those projects for which specific location information was not previously available.

The specific projects analyzed in this report are:

- Eurisko Scientific Enhanced Transportation Biomethane Production from Municipal Sludge Digesters – Elk Grove, California
- Northstate Rendering Anaerobic Digestion of Rendering Waste to Make Compressed Natural Gas Vehicle Fuel – Oroville, California
- Pixley Biogas – Pixley, California
- High Mountain Fuels Simi Valley Bio-Liquefied Natural Gas (LNG) Production Plant – Simi Valley, California

**Keywords:** California Energy Commission, AB 118, localized health impacts, environmental justice, funding cycle, emissions, criteria emissions, air quality, greenhouse gas emissions, reduce petroleum use, improve air quality, alternative fuel, electricity, natural gas, biomethane, propane, hydrogen, ethanol, renewable diesel, biodiesel fuels

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# CHAPTER 1: Background

The California Energy Commission is preparing to approve a series of projects through the Alternative and Renewable Fuel and Vehicle Technology Program (Health and Safety Code Section 44272). The Energy Commission developed this report to comply with the Air Quality Guidelines.<sup>1</sup> The section applies to all projects that require a permit and reads:

(6) Localized health impacts must be considered when selecting projects for funding. The funding agency must consider environmental justice consistent with state law and complete the following:

(A) For each fiscal year, the funding agency must publish a staff report for review and comment by the public at least 30 calendar days prior to approval of projects. The report must analyze the aggregate locations of the funded projects, analyze the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, and identify agency outreach to community groups and other affected stakeholders.

(B) Projects must be selected and approved for funding in a publicly noticed meeting.

The Air Quality Guidelines section requiring this analysis was put in place to ensure that, by funding the projects, the Energy Commission is both analyzing the potential beneficial impacts to communities with the most significant exposure to air contaminants, and not supporting projects that result in disproportionate health impacts in communities with low-income or minority populations.

For the current program funding cycle (Fiscal Year [FY] 2009/10), there are 10 projects proposed for Energy Commission approval that require a permit. Six of these projects were analyzed in the first localized health impacts report published on May 5, 2010.

Table 1 provides a summary of the projects by solicitation (Program Opportunity Notice).

**TABLE 1: Count of Awards by Solicitation for FY 2009/2010**

Project Type	Program Opportunity Notice	Number of Projects
Electric Vehicle (EV) charging stations	PON-08-010	4
Natural Gas (NG) fueling stations	PON-08-010	1
Ethanol (E-85) fueling stations	PON-08-010	1
Biomethane production	PON-09-003	4

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<sup>1</sup> Regulation for the AB 118 Air Quality Guidelines for the Air Quality Improvement Program and the Alternative and Renewable Fuel and Vehicle Technology Program, California Code of Regulations, Title 13, Chapter 8.1, Section 2343(c)(6), 2008

The biomethane production projects are facilities that will produce biomethane for transportation fuel or process energy at a fuel production facility. One of the four projects proposed for funding has an onsite fueling station to serve fleets where the gas is produced; two will transport the compressed natural gas (CNG) or liquefied natural gas (LNG) to a station via pipeline or trucks for use in vehicles; and the fourth project will produce natural gas for process energy for an ethanol production plant.

The following is a discussion of the localized health impacts of the biomethane production projects being proposed for Energy Commission approval. Energy Commission staff plans to present the proposed projects for approval at Business Meetings (subject to the Warren-Alquist Open Meeting Act) in June 2010.

This analysis is not intended as a substitute for the California Environmental Quality Act (CEQA) process. The application of CEQA will take a more detailed look at the potential environmental impacts of the proposed projects. Instead, this report is intended to collect available information about the potential beneficial and adverse air quality impacts of the projects that the Energy Commission is funding through the Alternative and Renewable Fuel and Vehicle Technology Program, and provide an aggregate, narrative analysis of localized health impacts of those projects. Some projects do not have precise locations identified at the time the proposals were submitted, impacting the Energy Commission's ability to evaluate the aggregate locations in detail. The locations of these projects will be tracked by Energy Commission staff as the projects progress, and receive public comment for consideration in future editions of this report.

In addition, the Energy Commission is mandated by the Air Quality Guidelines to track each project's progress through the CEQA process and ensure that project proponents commit to completing all mitigation measures required by the permitting agency prior to a project receiving the first funding allocation.

## **Project Overviews**

The following is an overview of the projects proposed for awards. The overviews include a project description, information on the existing site, discussion on the potential health impacts related to air pollutants, and outreach efforts explicitly identified in the project proposals.

Demographic data for the known or planned project locations is provided in Table 2. Program staff collected data on ethnicity, age, and income for the city where the project will be located to identify communities with higher minority populations, lower incomes, and higher sensitive groups based on age. For the purposes of this discussion, program staff identified sensitive populations as fewer than five years of age and over 65 years of age. While this demographic information is important to provide a snapshot of the area where the projects are located, it is less relevant because the projects proposed for funding are found to have no adverse health impacts.

Staff also reviewed results from the Environmental Justice Screening Method (EJSM)<sup>2</sup> to identify projects that are located in areas with social vulnerability indicators and the greatest exposure to air pollution and associated health risks. These results are available for Southern California.

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<sup>2</sup> *Air Pollution and Environmental Justice, Integrating Indicators of Cumulative Impact and Socio-Economic Vulnerability into Regulatory Decision-Making* 2010. Manuel Pastor Jr., Ph.D., Rachel Morello-Frosch, Ph.D., James Sadd, Ph.D.

The Air Resources Board applied the method<sup>3</sup> to the Bay Area, San Joaquin Valley, and Desert regions, however, the results only consider income among the list of social vulnerability indicators.

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<sup>3</sup> *Proposed Screening Method for Low-Income Communities Highly Impacted by Air Pollution for AB 32 Assessments*2010.

# CHAPTER 2:

## Biomethane Production

### *Project Name:*

Eurisko Scientific Enhanced Transportation Biomethane Production from Municipal Sludge Digesters

### *Project Description*

This project will employ anaerobic digestion technology using wastewater sludge and effluent at the Elk Grove Wastewater Treatment facility, owned by the Sacramento Regional County Sanitation District, to produce biomethane for transportation use. The process is designed to sequester carbon dioxide (CO<sub>2</sub>) during the digestion process. The process increases the rate of gas production, increases the volume of biogas production, increases the biomethane content of the biogas, reduces the impurities in the gas, and reduces the CO<sub>2</sub> content through sequestration. A byproduct is calcium carbonate. An estimated 5,000 standard cubic feet of compressed biomethane (approximately 1,250 gasoline gallon equivalent) can be produced per ton of wet waste material. Clean Energy will supply compression equipment and distribute the biomethane produced for transportation use through their existing fueling facilities.

### *Project Site*

The project will be located at the Sacramento Regional Wastewater Treatment Plant at 8521 Laguna Station Road, Elk Grove, California. The project proposes an additive to an existing sludge digester that will increase biomethane production. The additive consists of serpentine rock and olivine sand.

There are no schools, daycares, or health care facilities within a one-mile radius of the project site.

### *Potential Impacts*

This production facility will use municipal sludge waste to produce biomethane. The existing digester is enclosed and the additive that will be demonstrated is a solid material. Biomethane gas is produced by the digester. After impurities are scrubbed, liquid or compressed gas fuel will be used in vehicles. In summary, the project will demonstrate the ability of the additive to increase the volume of generated biomethane from anaerobic digestion. The digester that will be used will be a component of an existing, operating, permitted system in California.

Emissions and byproducts are expected to be less and lower than currently employed technologies. This project is not expected to result in adverse health impacts to sensitive populations at the project sites or in the cities where the stations will be located.

### *Outreach Efforts*

The local air district requires a permit for fuel production facilities as they are considered to be potential emission sources. This project is not proposing a new facility. The applicant is not anticipating the need to go through the permitting process because the project proposes a modification to the existing digester technology.

Should this project require a permit, the air district will evaluate the facility emissions during the permitting evaluation process and will adhere to federal and state regulations to notice residents within 1,000 feet of the site if the project will result in an increase in emissions above the threshold.

The air district will also post notices to the Air Resources Board and Environmental Protection Agency websites and in local newspapers if the project is using emission offsets or emission reduction credits.

An outreach and marketing plan will be developed for this project. Details regarding the contents of the plan are not provided in the proposal.

### ***Project Name***

Northstate Rendering Anaerobic Digestion of Rendering Waste to Make CNG Vehicle Fuel

### ***Project Description***

This project will build an anaerobic digester that will use animal rendering material and food waste at the privately-owned Northstate Rendering facility. The biomethane produced will be used as a vehicle fuel for the company's fleet of delivery trucks. The Western United Dairymen will use the remainder of the compressed biomethane in dairy trucks. In addition, the digester solids will be composted for agriculture use.

Approximately 43 tons per day (over 15,000 tons per year) of rendering waste will be fed to the digesters, along with food waste from surrounding agriculture-related industries. The conditioned biogas will be injected into the Pacific Gas and Electric gas pipeline and sold as vehicle fuel to the CNG fleets. The gas will be used to replace approximately 10,000 gallons of diesel per month used by the rendering facility's trucks.

### ***Project Site***

The project will be located at the Northstate Rendering Facility at 15 Shippee Road, Oroville, California. The project proposes to build anaerobic digesters to make biogas from the rendering material at their existing facility. The location is currently permitted for accepting the waste feedstock required for digestion, and has the pre-processing and post-digestion equipment necessary for relatively simple integration of the digesters with the existing infrastructure.

A 500 pound per square inch Pacific Gas and Electric natural gas pipeline runs through the property, minimizing the requirement for additional pipeline and making the integration of the biogas conditioning equipment relatively easy.

This facility is located in a non-attainment area for ozone, particulate matter (10 micron), and particulate matter (2.5 micron) pollutants. There are no schools, daycares, or health care facilities within a one-mile radius of the project site.

### ***Potential Impacts***

The improvements to air quality will be significant, especially as more firms adopt the technology to generate vehicle fuel. By replacing diesel with biomethane in more corporate fleets, millions of tons of CO<sub>2</sub>, nitrogen oxide (NO<sub>x</sub>), particulate matter, and toxics will be eliminated from California's air over the years.

Anaerobic digestion of the waste eliminates the need to landfill the waste. By diverting this waste to digesters, significant emission reductions are realized. The project will further reduce air pollutants and air toxics by supplying biomethane onsite to the customer's natural gas truck fleet. Pollutants are further reduced where the customer fleet is refueled at the home base rather than at a remote fueling station.

This project is not expected to result in adverse health impacts to sensitive populations at the project sites or in the cities where the stations will be located.

### ***Outreach Efforts***

The Butte County Air Quality Management District requires a permit for fuel production facilities as they are considered to be potential emission sources. The air district will evaluate the facility emissions during the permitting evaluation process and will adhere to federal and state regulations to notice residents within 1,000 feet of the site if the project will result in an increase in emissions above the threshold.

The air district will also post notices to the Air Resources Board and Environmental Protection Agency websites and in local newspapers if the project is using emission offsets or emission reduction credits.

### ***Project Name***

Pixley Biogas

### ***Project Description***

This project will employ anaerobic digestion of dairy manure. The digesters will be located on property owned by Calgren Renewable Fuels and zoned for industrial use. The manure will come from three dairies in close proximity to the Calgren facility, a 55 million gallon per year ethanol production plant.

All of the biogas will be used to provide renewable energy to the Calgren facility, reducing the overall life cycle carbon footprint of the vehicle fuel that Calgren produces. The digester facility will produce 266 million British thermal units (mmBTU)/day biogas to generate electricity at the Calgren facility to produce ethanol for transportation fuels.

### ***Project Site***

The project will be located on a three-acre parcel of property adjacent to the Calgren Renewable Fuels facility at 11704 Road 120, Pixley, California.

This facility will be located in the San Joaquin Valley Air Basin, a non-attainment area for ozone, particulate matter (10 micron), and particulate matter (2.5 micron) pollutants. The project is located in a low-income community with a high level of air pollutant exposure. There are no schools, daycares, or health care facilities within a one-mile radius of the project site.

### ***Potential Impacts***

This project is expected to reduce emissions, equipment wear, and potential nutrient overloading of fields. The removal of these solids will decrease farm water usage and manure handling costs. The digester will also use waste heat from the Calgren facility. The project will reduce the plant consumption of natural gas by 403 mmBTU per day, equal to 13.1 percent of the combined thermal and electrical load.

Processing approximately 36.5 million gallons of manure every year, the project will reduce air emissions of methane, hydrogen sulfide, and other smog and odor-causing chemicals generated by storage of undigested manure in the greater Pixley area improving regional air quality and reducing greenhouse gas (GHG) emissions.

This project is not expected to result in adverse health impacts to sensitive populations at the project sites or in the cities where the stations will be located.

### ***Outreach Efforts***

The San Joaquin Valley Air Pollution Control District will likely require a permit for this fuel production facility as it is considered to be potential emission source. The air district will evaluate the facility emissions during permitting evaluation process and will adhere to federal and state regulations to notice residents within 1,000 feet of the site if the project will result in an increase in emissions above the threshold.

The air district will also post notices to the Air Resources Board and Environmental Protection Agency websites and in local newspapers if the project is using emission offsets or emission reduction credits.

### *Project Name*

High Mountain Fuels Simi Valley Bio-Liquefied Natural Gas (LNG) Production Plant

### *Project Description*

The project will produce bio-LNG from landfill gas wells at the Simi Valley Landfill, owned by Waste Management, and construct a bio-LNG fueling facility at the landfill site. The proposed project is 40 percent larger than the first California landfill-to-gas project at Altamont Landfill and further improves the process used at the Altamont Landfill project by using Pressure Swing Adsorption (PSA) technology. The PSA technology will reduce GHG emissions for bio-LNG to 85 percent below the diesel baseline, rather than the 73 percent reduction for standard process LNG from landfill gas. The PSA technology also increases production efficiency of methane by 5 percent on a volume basis.

The LNG will be used for 500 waste hauling trucks.

### *Project Site*

The project will be located at the Simi Valley Landfill in Ventura County.

These stations will be located in the South Coast Air Basin, a non-attainment area for ozone, particulate matter (10 micron), and particulate matter (2.5 micron) pollutants.

There are no schools or daycares within a one-mile radius of the project site. There is one health care facility within the one-mile radius.

### *Potential Impacts*

The creation of a renewable and clean fuel through the recycling and repurposing of waste products has substantive positive impacts on all environmental systems, including the air, ground, and water. The waste recycling process removes gases that would have been emitted into the atmosphere and converts that product into a renewable fuel for low emission vehicles.

Compared to other biofuels, the production of Bio-LNG from landfill gas has minimal water use and wastewater discharge. This intrinsically sustainable feedstock also does not impact arable land that would otherwise be used for forestry products or food crops.

The heavy-duty vehicles fueled by the plant's Bio-LNG will travel through the most economically distressed areas of Southern California because heavy-duty trucking facilities are often located in those distressed areas. By switching to Bio-LNG, the trucks will have significantly less impact on the environment and human health in those areas. The reduction in criteria pollutants and toxic air contaminants have a direct impact on those exposed communities, so the emission reductions from using Bio-LNG help reduce overall medical issues in those impacted areas.

Waste Management (WM), one of the project partners, began working with Ventura County on the Environmental Impact Report (EIR) for the expansion of the Simi Valley Landfill in 2007. Ventura County completed the draft EIR and closed the public review and comment period on December 28, 2009. The county is in the process of preparing the final EIR. While the county has not completed the EIR process, WM expects that a certified EIR approving the project could be available in August 2010.

This project is not expected to result in adverse health impacts to sensitive populations at the project sites or in the cities where the stations will be located.

### *Outreach Efforts*

The Ventura County Air Pollution Control District requires a permit for fuel production facilities as they are considered to be potential emission sources. The air district will evaluate

the facility emissions during permitting evaluation process and adheres to federal and state regulations to notice residents within 1,000 feet of the site if the project will result in an increase in emissions above the threshold.

The air district will also post notices to the Air Resources Board and Environmental Protection Agency websites and in local newspapers if the project is using emission offsets or emission reduction credits.

## CHAPTER 3:

# Aggregate Location Analysis and Community Impacts

An Air Resources Board fact sheet<sup>4</sup> describes the health impacts of exposure to air pollutants. In particular, ozone and particulate matter exposure is the cause of approximately 210,000 cases of asthma and 8,800 premature deaths each year.

The proposed biomethane projects will increase the widespread use of alternative fuel vehicles in place of their petroleum counterparts. In addition to the specific fleet vehicles addressed by the projects, these fuel production projects will support existing alternative fuel vehicles and new alternative fuel vehicles deployed throughout California. Biomethane is often regarded as one of the lowest carbon, renewable fuels available for several reasons. As mentioned in the project overviews, biomethane production for transportation from landfill gas, wastewater, and dairy digesters provides emission benefits by utilizing methane that would have otherwise been released into the environment by flaring or some other means to produce a low-carbon transportation fuel.

The Energy Commission recognizes that emissions may result from production and transport of the fuel. However, the emission reductions from the use of biomethane for process energy or transportation fuel far exceed those increases, resulting in significant net emission reductions.

The four projects analyzed in this report are located primarily in rural areas with small populations in the immediate vicinity. Of the four projects, only the Simi Valley Landfill project has a sensitive receptor (health care facility or senior center) within a one-mile radius.

Table 2 provides city-level data for the proposed projects to give additional insight on the community demographics where the projects will be located. The unemployment rate and poverty levels are notably high in two project locations, Oroville and Tulare. Furthermore, 20 percent of Tulare's population falls below the poverty level and Tulare has a significantly higher Hispanic population, representing nearly half of the total population. In addition to the air quality improvements from the Pixley Biogas project proposed in Tulare, the project is expected to create approximately 188 jobs and help retain approximately 141 jobs. Job creation is one of several economic benefits expected from this project for the Town of Pixley and the City of Tulare.

The projects proposed for funding will result in criteria emission reductions, including those identified as the cause of asthma and premature deaths. The emissions benefits of the projects are anticipated to lead to improved air quality in these communities. While overall air quality is dependent on a number of factors, the Energy Commission expects that air quality will improve over time with the increased use of alternative fuels, including in disadvantaged communities and those communities with the most significant exposure to air contaminants.

No communities are disproportionately affected as a result of these biomethane production projects and the fueling infrastructure projects proposed for funding from the previous program opportunity notice.<sup>5</sup> In summary, the proposed projects will reduce emissions, exposure, and health risk at a local level based on the assumption that the vehicles deployed and operated in concert with the projects are cleaner than the gasoline vehicles they will replace.

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<sup>4</sup> Health Effects of Particulate Matter and Ozone Air Pollution, November 2007

<sup>5</sup> American Recovery and Reinvestment Act Cost Share: Alternative and Renewable Fuel and Vehicle Technology Program, PON-08-010, April 2009



**TABLE 2: Demographic Data for Biomethane Production Projects**

(Percentage of total population)

	Elk Grove	Orville	Simi Valley	Tulare
<b>Below poverty level</b>	3.8	20.7	5.8	20.7
<b>Ethnicity</b>				
Black	8.5	8.5	1.3	5
American Indian or Alaskan Native	.9	2.2	.7	1.4
Asian or Pacific Islander	18.2	4.3	6.4	2.1
Hispanic	14	12.9	16.8	45.6
White	53.8	88.8	81.3	56.4
<b>Age</b>				
< 5 years	7.9	5.8	7.3	9.6
> 65 years	6.8	15	7.6	9.4
<b>Unemployment rate</b>	10.5	20.5	9.2	16.1

SOURCE: Unemployment Information, Employment Development Department Labor Market Information Division; Age/Ethnicity Demographics, Census