Department of Pesticide Regulation

Environmental Justice Pilot Project
Project Objectives, Pesticides, and Community for Monitoring

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Overview

As part of its Environmental Justice Action Plan, Cal/EPA is conducting six pilot projects that incorporate some of the themes in the Governor's Environmental Action Plan and focus on environmental risk factors that impact children's health. As part of this effort, the Department of Pesticide Regulation (DPR) will conduct an air monitoring project in the Fresno County community of Parlier. This document describes objectives and activities for the first phase, and provides background on how the community and pesticides were selected.

DPR's project, as well as the other Cal/EPA environmental justice pilot projects, will include additional elements to address definitions of and guidance for cumulative impacts, precautionary approaches, and public participation. These elements will be addressed as the project evolves. In addition, DPR's pilot project will include a strong public participation focus, with establishment of a local advisory group (LAG). The LAG will provide recommendations and input to the DPR staff involved in that pilot project. The LAG has

been selected to provide for a diversity of viewpoints and representation of community representatives, local agencies, the business community, and other local stakeholders

Project objectives:
The objectives define the scope of the project. These objectives may be refined after discussion with the LAG.:

- Are residents of the community exposed to pesticides in the air?
- Which pesticides are people exposed to and in what amounts?
- Do measured pesticide air levels exceed levels of concern to human health, particularly children?

Candidate pesticides to monitor:
DPR proposes to attempt to monitor for 21 to 27 pesticides. Candidate pesticides were selected based on the following criteria:

- Statewide use
- Volatility
- DPR risk assessment priority
- Valid monitoring method

Community selection:
DPR evaluated 83 communities, 81 of them in Merced, Madera, Fresno, Kings, and Tulare counties. In addition, one community each was evaluated in Kern and Stanislaus counties. These criteria were used to prioritize the communities:

- Community environmental justice factors
    - Child population (less than 18 years old)
    - Non-white population
    - Family income
    - Pesticide drift illnesses
- Availability of cumulative impact data
    - Pesticide well monitoring
    - Monitoring stations for criteria air pollutants
- Pesticide use
    - Regional use (within 5 miles of community) of four different categories of pesticides
    - Local use (within 1 mile of community) of four different categories of pesticides

DPR also considered other factors, including air sampling feasibility, weather patterns, and the potential for collaboration with other projects focused on environmental health.

Based on an extensive analysis of all these factors, DPR selected Parlier in Fresno County for monitoring.

Introduction

Cal/EPA's environmental justice strategy includes four overall goals:

1. Ensure meaningful public participation and promote community capacity-building to allow communities to effectively participate in environmental decision-making processes.
2. Integrate environmental justice into the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.
3. Improve research and data collection to promote and address environmental justice related to the health and environment of communities of color and low-income populations.
4. Ensure effective cross-media coordination and accountability in addressing environmental justice issues.

As part of its Environmental Justice Action Plan, Cal/EPA is developing and conducting six pilot projects that incorporate these goals and some of the themes in the Governor's Environmental Action Plan, emphasizing environmental risk factors that impact children's health. DPR was asked to develop a pilot project in the Central Valley, focusing on pesticides in a rural, farming community.

Because they are located closer to agricultural fields, California rural communities may have higher concentrations of pesticides in ambient air compared to urban communities. Air monitoring conducted by DPR and ARB currently provides limited data to estimate human exposure to both single and multiple pesticides over several months or years.

This pilot project will provide more systematic air monitoring for a community in the Central Valley and therefore will serve as a more robust foundation for exposure assessment. DPR conducted a similar project in Lompoc (Santa Barbara County) and the U.S. Environmental Protection Agency is completing one in McFarland (Kern County). DPR will use similar methods for this study. For example, air sampling devices are typically placed on the roofs of public buildings (like schools), and analyses are done for a number of targeted pesticides. The study will include as many as 27 pesticides. Monitoring will likely occur at two to four sites in Parlier, sampled four to twelve times per month, for 6 to 12 months. As the first step in the planning process, DPR established the following project objectives, criteria for selecting pesticides, and criteria for selecting the community for monitoring.

Project Objectives

The objectives define the scope of the project and are consistent with the overall environmental justice goals. The goal in developing the objectives was to make them simple, measurable, attainable, realistic, and timely. DPR selected the following objectives, but may refine them after discussion with the LAG.

- Are residents of the community exposed to pesticides in the air?
- Which pesticides are people exposed to and in what amounts?
- Do measured pesticide air levels exceed levels of concern to human health, particularly children?

Pesticide Candidates for Monitoring

DPR selected candidate pesticides for monitoring based on potential health risk, with higher-risk pesticides having higher priority for monitoring. DPR selected higher-risk pesticides based on the following criteria:

- Statewide use
- Volatility
- DPR risk assessment priority*
- Valid monitoring method

** NOTE: Risk assessments have been completed on several of the target pesticides. However, each pesticide is at some point assigned a priority for risk assessment based on a number of factors, including health concern. The risk assessment priority ranking assigned to the pesticide was therefore incorporated as a factor in selecting pesticides to be targeted in this project.*

Pesticide health risk is a function of exposure and toxicity. Use and volatility are surrogates for exposure. Risk assessment priority is a surrogate for toxicity. Priority was also given to pesticides that can be monitored as part of a suite of chemicals (that is, pesticides for which a laboratory method exists that allows detection of multiple pesticides in a single analysis).

Table 1 (below) shows the top 100 pesticides used on agricultural sites in the state during 2002 which are potential candidates for monitoring. (2002 data was the most recent available when this analysis was done.) The 19 pesticides with scores of 10 or higher are considered high-priority candidates for monitoring.

Two of the nineteen pesticides (paraquat and maneb) cannot be monitored because no method to analyze them in air has been developed. (DPR and ARB efforts in this regard have not been successful to date.)

Several pesticides can only be monitored as single compounds. DPR has resources to use no more than two analytical methods in this project. The first should be a modification of the method DPR used for its Lompoc project, as it is a “screening” method that allows a single test to detect multiple chemicals (in this case, as many as 24 different pesticides). The other method should be a single-chemical method for another high priority pesticide, such as methyl isothiocyanate (MITC, a breakdown product of metam-sodium), or chloropicrin.

Some high-priority pesticides, in particular methyl bromide and 1,3-dichloropropene, cannot be analyzed with instruments available to DPR. The State Air Resources Board (ARB) conducted the previous ambient air monitoring for these pesticides as part of DPR’s toxic air contaminant program. ARB has agreed to assist DPR in this project by monitoring for these pesticides.

The final selection of the pesticides for monitoring will be made in consultation with the LAG.

New monitoring methods will have to be developed for this project. While this pilot project will be in the San Joaquin Valley, in future years, air monitoring may be done in other areas of the state. Therefore, the laboratory is attempting to add several pesticides to the Lompoc method, including ones with that are little used in the San Joaquin Valley. If the laboratory

can develop a single procedure for a broad range of pesticides, DPR will be able to use a standard method in each new area monitored, achieving significant cost savings.

Community Candidates for Monitoring

DPR selected the community based on objective data, using criteria that can be quantified, validated, and verified. This provides a more transparent and fair selection process.

DPR evaluated 83 communities, 81 of them in Merced, Madera, Fresno, Kings, and Tulare counties. These five counties have high pesticide use (all are among the top 10 counties) and can be sampled by DPR's Fresno-based staff. In these five counties, DPR evaluated all communities included by name in the 2000 U.S. Census, except those communities in foothill areas. Several of these communities had been suggested by persons who commented on earlier drafts of this plan.

DPR also evaluated two communities suggested by commenters that are not in one of the five counties, Arvin (Kern County) and Grayson (Stanislaus County).

Commenters also made numerous suggestions for criteria to select the community. DPR developed its selection method based primarily on criteria suggested by one or more commenters. Each of the 83 communities were rated on the following categories and subcategories:

- Environmental justice factors
    - Population density of children (less than 18 years old)
    - Non-white population percentage
    - Median family income
    - Number of drift illnesses
- Availability of cumulative impact data
    - Monitoring density for pesticides in municipal wells
    - Monitoring stations for criteria air pollutants
- Pesticide use
    - Regional (within 5 miles of community) use density of organophosphates
    - Regional (within 5 miles of community) use density of fumigants
    - Regional (within 5 miles of community) use density of copper and sulfur
    - Regional (within 5 miles of community) use density of other pesticides
    - Local (within 1 mile of community) use density of organophosphates
    - Local (within 1 mile of community) use density of fumigants
    - Local (within 1 mile of community) use density of copper and sulfur
    - Local (within 1 mile of community) use density of other pesticides

Category Descriptions:

All subcategories were assigned a factor of 1 to 4 (a few subcategories were assigned rating factors from zero to 4). Four represented the highest priority for monitoring. For each subcategory, the 83 communities were divided into four groups. In most cases, the 20 communities with the highest values (or lowest values where appropriate) were rated four, the second 21 communities were rated three, and so forth. In most cases, the subcategory ratings are based on density per square mile rather than numerical totals. This minimizes the effect of the size of the community in the ratings. Without this adjustment, large

communities such as Fresno would show much greater child population and pesticide use in comparison to communities with small areas.

Child population density was determined from the 2000 Census and expressed as number of people less than 18 years old per square mile of the community. The 83 communities were divided into four groups and rated one to four, as described above.

Non-white population percentage was determined from the 2000 Census and expressed as the percentage of the community population. The 83 communities were divided into four groups and rated one to four, as described above.

Median family income was determined from the 2000 Census and expressed as the number of dollars per year. The 83 communities were divided approximately into four groups and rated one to four, as described above.

Drift illnesses were determined from DPR's Pesticide Illness Surveillance Program database for 1993 through 2002, and expressed as the number of non-occupational drift illnesses within the community. Only 11 of the 83 communities had illnesses documented in the database, so the normal groupings were not used. The four communities with 51 or more illnesses were rated four. No communities were rated three. The three communities with 13 to 16 illnesses were rated two. The four communities with two to seven illnesses were rated one. All other communities were rated zero. DPR considered expressing drift illnesses as a density or per capita basis, but this appeared to add an unnecessary level of complexity since only a few communities had illnesses and most were associated with small communities. DPR also considered using number of drift episodes, rather than number of illnesses as the criterion. However, very few communities had more than one episode, so this provided very little separation in ratings between communities.

Monitoring density for pesticides in municipal wells was determined from DPR's Well Inventory database for 1999 to 2004 and expressed as

$$\frac{\text{Number of municipal wells sampled x number of pesticides sampled}}{\text{Square miles of the community}}$$

Of the 83 communities, 28 had no municipal well monitoring data and were rated zero. The remaining communities were divided into groups with similar well monitoring densities. The 23 communities with the highest well monitoring density were rated four. The next 13 communities were rated three. The next seven were rated two. The next 12 were rated one.

Air monitoring stations were determined from ARB's and San Joaquin Valley Air Pollution Control District's (APCD) air monitoring network, and expressed as the number of criteria air pollutants monitored within the community. Of the 83 communities, 75 have no air monitoring stations. Three communities are monitored for five to six criteria air pollutants and were rated four. Two communities are monitored for three criteria air pollutants and were rated three. Three communities are monitored for one or two criteria air pollutants and were rated two. Those with no monitoring stations were rated zero.

All ***pesticide use*** was determined from DPR's 2002 pesticide use report database, and divided into eight subcategories. Use was compiled for two different area sizes and four types of pesticides. The two areas were regional and local use. ***Regional use density*** was expressed as pounds reported per square mile within five miles of the community boundary. ***Local use density*** was expressed as pounds reported per square mile within one mile of the community boundary.

Commenters were interested in specific types of pesticides. In addition, disparities in application rates (and therefore, in amount used per application) would give disproportionate weight to some pesticides if use were rated on total pounds of all pesticides. Therefore, pesticide use density was divided into four types:

- Organophosphates (14 pesticides in this subcategory);
- Fumigants (4 pesticides);
- Sulfur and copper (2 pesticides); and
- 13 other pesticides included in the Lompoc multi-pesticide method, or which DPR is attempting to add to the Lompoc method.

For each of the eight pesticide subcategories, the 83 communities were divided approximately into four groups, usually with the 20 communities with the highest pesticide use density rated four, the second 21 communities rated three, and so forth. A few communities had no use of some of the pesticide subcategories. These were rated zero.

How the community rating factors were weighted:
A rating for each of the three major categories (environmental justice, availability of cumulative impact data, and pesticide use) was determined by averaging the subcategory ratings. The three major category ratings were then added together for an overall community rating. This system gives equal weight to each of the three major categories.

Communities that are highly rated for monitoring:
Table 2 (below) shows the subcategory, category, and overall ratings for each community. The key to Table 2 gives a detailed description of the rating system. Appendix A contains charts showing a comparison of the 30 communities with the highest overall ratings for each of the 14 subcategories.

Based on this system, the following communities had the highest <u>overall ratings</u> (maximum rating of 12):

- Parlier (Fresno County), 10.0
- Arvin (Kern County), 8.4
- Visalia (Tulare County), 8.4
-

The following communities had the highest <u>environmental justice ratings</u> (maximum of 4):

- Earlimart (Tulare County), 4.0
- Arvin (Kern County), 3.5
-

The following communities had the highest <u>cumulative data availability ratings</u> (maximum of 4):

- Clovis (Fresno County), 3.5

- Parlier (Fresno County), 3.5
- Visalia (Tulare County), 3.5

The following communities had the highest pesticide use ratings (maximum of 4):
- Kingsburg (Fresno County), 3.9
- London (Tulare County), 3.8
- Huron (Fresno County), 3.6

Figure 1 shows the geographic locations of the highly rated communities listed above.

Air Sampling Considerations:
Several of these communities are currently monitored by ARB or the APCD for criteria air pollutants, or have been monitored previously for the toxic air contaminant program. In addition, DPR staff scouted most of the highly rated communities for monitoring sites. Monitoring sites must meet the following minimum criteria:
- The location of sample collection meets all U.S. EPA ambient air siting criteria
    - 2 to 15 meters above ground
    - At least 1 meter horizontal and vertical distance from supporting structure
    - Should be at least 20 meters from trees
    - Distance from obstacles should be at least twice the obstacle height
    - Unobstructed air flow for 270°
- Accessible to sampling personnel during time of sampling
- Accessible to electrical outlets
- Secure from equipment loss or tampering
- Permission of site operator/owner

Preferred monitoring sites also meet the following criteria:
- School, day care center, or other "sensitive site"
- Located on the edge of the community and/or adjacent to agricultural fields
- Can be routinely sampled in four hours by DPR Fresno staff (minimizing travel time and costs and thus maximizing resources that can be directed to sampling and analysis)

The monitored community should have at least two sites that meet the minimum and preferred criteria listed above. DPR's preliminary observations show that the following highly rated communities do not meet all of these criteria:
- Arvin – cannot be sampled within four hours
- London – possibly one location that meets the preferred siting criteria

However, no site was eliminated from consideration because it could not meet the preferred criteria.

Weather Considerations:
Certain weather conditions are known to produce higher air concentrations, all other factors being equal. These conditions include low wind speed or calm conditions and persistent wind direction. DPR evaluated weather data from the State Department of Water Resources – California Irrigation Management Information System (CIMIS), for 1995 through 2004. Ratings were not determined for each community due to the overwhelming amount of

meteorological data. However, the highly rated community candidates can be divided into a few geographic areas. The historical weather data for the following areas were compared:

- Arvin
- Huron
- Mendota
- Parlier
- Visalia

Figures 2 and 3 show the wind speed and wind direction for each of these communities. Figure 2 shows that low wind speeds (less than 4.5 miles/hour or 2 meters/second) occur with greater frequency in Arvin, Parlier, and Visalia. Figure 3 shows that persistent wind direction occurs with greater frequency in Huron and Mendota. Since none of the communities had high frequency of both low wind speeds and persistent wind direction, air concentrations in these five areas would likely be comparable, all other factors being equal. In other words, weather conditions do not favor one community over another for this project.

Other Considerations:
Of the highly rated communities, the following ones may be less desirable for monitoring because they may not meet one or more of the overall environmental justice goals of the pilot project:

- Clovis – relatively low percentage of non-whites in population; relatively high income levels; relatively large population and area
- Kingsburg – relatively low percentage of non-whites in population; relatively high income levels
- Visalia – relatively low percentage of non-whites in population; relatively high income levels; relatively large population and area

Collaboration with other projects:
A number of communities under consideration offered benefits associated with collaboration with organizations planning complementary or related studies:

- The University of California, Davis, Agricultural Health and Safety Center plans a study of occupational and environmental health hazards in a migrant farmworker population, focusing on Mendota.
- The University of California, San Francisco, Valley Air Pollution Health Effects Research Institute in Fresno plans a study to evaluate correlations between asthma in children and air toxics, including pesticides. This study will examine asthma prevalence and air concentrations at two urban and two rural schools. The schools have not been selected, but they will likely be located in Fresno County.
- The California Environmental Health Tracking Program (joint program of the Centers for Disease Control and Prevention, California Department of Health Services, and Cal/EPA's Office of Environmental Health Hazard Assessment) is conducting a pilot project in the San Joaquin Valley to demonstrate the feasibility of linking exposure (including pesticides) and health outcomes data. This project will also evaluate potential relationships between exposure and health outcomes.

In this regard, Parlier and Mendota are more desirable for monitoring to take advantage of these collaborative projects.

Conclusions and Recommendations

Pesticides:

DPR selected pesticides for monitoring based on high statewide use, high volatility, high toxicity, and availability of monitoring methods. DPR likely has the resources to conduct monitoring using two methods. A modification of DPR's method used for the Lompoc project will be one of the methods used to analyze samples, as it will likely be able to analyze for most if not all of the following 21 pesticides (indicated by "DPR-Lompoc" or "DPR-Lompoc add" in Table 1): ***azinphos-methyl, chlorpyrifos, cypermethrin, diazinon, dicofol, dimethoate, diuron, endosulfan, EPTC, malathion, metolachlor, molinate, naled, oxyfluorfen, permethrin, propanil, propargite, SSS-tributyltriphosphorotrithioate (DEF), simazine, thiobencarb, and trifluralin***.

The other method will be a single-chemical method for another high-priority pesticide, such as ***MITC or chloropicrin***. With ARB assistance, the project will analyze for these pesticides as volatile organic compounds: carbon disulfide; 1,3-dichloropropene; and methyl bromide. ARB will also analyze for the following pesticides as metals/elements: chlorine, copper, and sulfur.

The pesticides included in the monitoring may be revised after discussion with the LAG.

Community:

DPR selected the community based on objective data. DPR has developed criteria that can be quantified, validated, and verified, providing a more transparent selection process. In addition, the analytical approach and information gathered will be useful in selecting communities for any future air monitoring projects.

DPR selected Parlier (Fresno County) for monitoring based on community environmental justice factors (child population, non-white population, income, drift illnesses); availability of cumulative impact data (well data, criteria air pollutant data); pesticide use (within one mile and five miles of the community); air sampling considerations; weather patterns; and possible collaboration with complementary studies.

Parlier has the highest overall rating (10.0) by a substantial margin. The next highest communities were Arvin and Visalia (8.4), Orange Cove (8.1), London (8.0), Cutler (7.8), and Reedley and Farmersville (7.6). Note that Parlier is 1.6 points higher than the next highest community, and 0.1 or 0.2 points separate most of the other communities. Alternatively, the 1.6 points separating Parlier and the two communities that ranked second is more than the 1.5 points separating the ratings of the next 20 communities (i.e., those ranked second through twenty-second).

In addition, Parlier is a candidate for UCSF's asthma study. Parlier also offers the potential of a collaborative relationship with the University of California Kearney Agricultural Center. The mission of the Kearney Center (located just outside Parlier) is to provide state-of-the-science research and educational programs to promote sustainability of California's agriculture industry and to enhance the quality of the rural environment. The possibility of consultation with the world-class scientists at Kearney would be beneficial not only during

the air monitoring portion but, even more important, during any mitigation development phase of the project. From a monitoring standpoint, Parlier likely has several preferred monitoring sites. Parlier's only drawback is that no non-occupational drift episodes have been reported. Also, "other" pesticides have moderate rather than high use.

DPR considered two other highly rated communities for monitoring: Arvin and Mendota. Arvin had the second highest overall rating (8.4). Arvin would be the preferred community if availability of cumulative impact data was not a factor, or if fumigant use was an overriding consideration. However, collection of cumulative impact data is one of the goals of all the environmental justice pilot projects being conducted by Cal/EPA. Furthermore, if this project was to focus on high fumigant use, the logical choice would have been a coastal farming community, as fumigant use is highest in the Central and Southern coastal areas of the state. A significant drawback for Arvin is that it is not a candidate for any of the collaborative health studies. Also, Arvin may only have one or two preferred monitoring sites. Its distance from Fresno (more than 130 miles) would mean that additional travel and per diem expenses would be incurred, resulting in fewer resources for sampling (10 to 30 percent fewer samples would be collected). Arvin's monitoring station for criteria air pollutants is located approximately three miles outside of the community.

Mendota has a lower overall rating (6.5, 25th highest) than Parlier and Arvin, as well as other communities, and normally would not be a leading candidate for monitoring. Mendota has little cumulative impact data available. Mendota has moderate use of most pesticides; none of the pesticide groups have high use. Mendota's advantage over other communities was the opportunity for collaboration with the UCD health study.

Tables 3 through 6 and Appendix B (maps showing key features and pesticide use) provide detailed information used to develop the rankings for Parlier, Arvin, and Mendota. Table 5 shows that a variety of commodities (although in different combinations) are grown in the region surrounding the leading candidate communities. The Parlier area primarily has fruit and nut orchards, and grapes, with some vegetables and nurseries. The Arvin area has more varied crops, including grapes, vegetables, cotton, and orchards. The Mendota area has grapes, vegetables, and field crops. From 19 to 39 different crops within five miles of each community were treated with candidate pesticides. Table 6 shows reported pesticide use from 2001 through 2003 (2004 data is not yet available) and indicates recent use is consistent for most pesticides.

The other communities with high overall ratings (Visalia, London, Orange Cove, Cutler, Reedley) do not offer any advantages over Parlier, except some have higher use of "other" pesticides, but lower ratings in most other categories. Earlimart and Huron would be highly rated (along with Parlier and Arvin) if availability of cumulative impact data was not a criterion for community selection.

Table 1. Pesticide candidates for DPR's environmental justice pilot project. Each category is rated one to four, with four representing the higher priority for monitoring (see key following table). Total Rating represents the sum of the use rating, volatility rating, and risk assessment rating. Pesticides with a "DPR-Lompoc" or "DPR-Lompoc add" monitoring method will likely be included in the monitoring.

Pesticide	2002 Statewide Use Rank	2002 Statewide Use (lbs)	Volatility	DPR Risk Assessment Priority	Monitor Method	Use Rating	Volatility Rating	Risk Assess Rating	Total Rating	TAC	Prop 65
1,3-DICHLOROPROPENE	6	5,412,503	High	High	ARB-VOC	4	4	4	12	yes	yes
CHLOROPICRIN	8	4,339,662	High	High	DPR-single	4	4	4	12	no	no
METAM-SODIUM [MITC]	3	15,518,465	High	High	DPR-single	4	4	4	12	yes	yes/no
METHYL BROMIDE	4	6,594,515	High	High	ARB-VOC	4	4	4	12	yes	some
POTASS N-METHYLDITHIO CARBAMATE [MITC]	18	1,267,737	High	High	DPR-single	4	4	4	12	yes	no
CHLORPYRIFOS	16	1,446,547	Med	High	DPR-Lompoc	4	3	4	11	no	no
MOLINATE	22	881,605	Med	High	DPR-Lompoc add	4	3	4	11	no	no
PROPARGITE	21	977,039	Med	High	DPR-Lompoc add	4	3	4	11	no	yes
SULFURYL FLUORIDE	9	3,045,084	High	Med	ARB-single	4	4	3	11	no	no
2,4-D, DMA SALT	41	452,155	Med	High	DPR-single	3	3	4	10	yes	no
ACROLEIN	59	283,541	High	High	ARB-single	2	4	4	10	yes	no
CHLOROTHALONIL	32	630,275	Med	High	ARB-single	3	3	4	10	no	yes
DIAZINON	29	689,603	Med	High	DPR-Lompoc	3	3	4	10	no	no
DIURON	17	1,303,745	Med	Med	DPR-Lompoc	4	3	3	10	no	no
MALATHION	33	619,811	Med	High	DPR-Lompoc	3	3	4	10	no	no
MANEB	25	852,435	Low	High	Unsuccessful	4	2	4	10	no	yes
PARAQUAT DICHLORIDE	24	869,244	Low	High	Unsuccessful	4	2	4	10	no	no
PROPANIL	15	1,470,535	Low	High	DPR-Lompoc add	4	2	4	10	no	no
TRIFLURALIN	19	1,103,442	Med	Med	DPR-Lompoc	4	3	3	10	yes	no
ACEPHATE	61	258,955	Med	High	DPR-single	2	3	4	9	no	no
ALDICARB	65	244,786	Med	High	DPR-single	2	3	4	9	no	no
CAPTAN	47	394,104	Low	High	Unsuccessful	3	2	4	9	yes	yes
CARBARYL	62	256,030	Med	High	DPR-single	2	3	4	9	yes	no
DIMETHOATE	52	332,543	Med	High	DPR-Lompoc	2	3	4	9	no	no
IPRODIONE	64	251,521	Med	High		2	3	4	9	no	yes
MANCOZEB	46	396,344	Low	High	Unsuccessful	3	2	4	9	yes	yes
MCPA, DMA SALT	50	347,377	Med	Med	DPR-single	3	3	3	9	no	no
NALED	73	201,504	Med	High	DPR-Lompoc	2	3	4	9	no	yes/no
OXYFLUORFEN	44	425,817	Med	Med	DPR-Lompoc add	3	3	3	9	no	no
PERMETHRIN	48	385,403	Med	Med	DPR-Lompoc	3	3	3	9	no	no
PHOSMET	45	405,088	Med	Med	DPR-single	3	3	3	9	no	no

Table 1 continued

Pesticide	2002 Statewide Use Rank	2002 Statewide Use (lbs)	Volatility	DPR Risk Assessment Priority	Monitor Method	Use Rating	Volatility Rating	Risk Assess Rating	Total Rating	TAC	Prop 65
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	76	190,149	Med	High	DPR-Lompoc add	2	3	4	9	yes	no
SIMAZINE	31	634,888	Med	Med	DPR-Lompoc	3	3	3	9	no	no
ZIRAM	30	654,062	Low	High	Unsuccessful	3	2	4	9	no	no
AZINPHOS METHYL	88	153,200	Med	High	DPR-Lompoc add	1	3	4	8	no	no
BENSULIDE	74	196,249	Med	Med		2	3	3	8	no	no
CHLORINE	39	502,944	High		ARB-metal	3	4	1	8	no	no
CHLORTHAL-DIMETHYL	72	201,919	Med	Med	DPR-single	2	3	3	8	no	no
CYPERMETHRIN	55	302,983	Med	Med	DPR-Lompoc add	2	3	3	8	no	no
DICOFOL	79	182,464	Med	High	DPR-Lompoc	1	3	4	8	no	no
ENDOSULFAN	89	150,954	Med	High	DPR-Lompoc	1	3	4	8	no	no
ETHEPHON	38	538,553	Med	Low		3	3	2	8	no	no
GLYPHOSATE, IPA SALT	5	5,625,732	Low	Low		4	2	2	8	no	no
IMIDACLOPRID	70	224,730	Med	Med	DPR-single	2	3	3	8	no	no
METHOMYL	54	321,476	Med	Med	DPR-single	2	3	3	8	no	no
NITROGEN, LIQUIFIED	36	561,505	High			3	4	1	8	no	no
PENDIMETHALIN	42	447,032	Med	Low		3	3	2	8	no	no
PETROLEUM HYDROCARBONS	37	554,623	High			3	4	1	8	no	no
SODIUM HYPOCHLORITE	35	568,308	High			3	4	1	8	no	no
SODIUM TETRATHIO CARBONATE [CS2]	49	352,342	High		ARB-VOC	3	4	1	8	yes	yes
THIOBENCARB	27	844,565	Med	Low	DPR-Lompoc add	3	3	2	8	no	no
(S)-METOLACHLOR	57	299,992	Med	Low	DPR-Lompoc add	2	3	2	7	no	no
CALCIUM HYDROXIDE	13	1,861,117	Low			4	2	1	7	no	no
COPPER HYDROXIDE	11	2,592,460	Low		ARB-metal	4	2	1	7	no	no
COPPER SULFATE (BASIC)	23	876,722	Low		ARB-metal	4	2	1	7	no	no
COPPER SULFATE (PENTAHYDRATE)	10	2,916,477	Low		ARB-metal	4	2	1	7	no	no
CRYOLITE	20	1,101,802	Low			4	2	1	7	no	no
MINERAL OIL	7	5,044,900	Low			4	2	1	7	no	no
NORFLURAZON	78	188,032	Med	Med		1	3	3	7	no	no
ORYZALIN	81	179,886	Med	Med		1	3	3	7	no	no
PETROLEUM DISTILLATES	14	1,554,311	Low			4	2	1	7	no	no

Table 1 continued

Pesticide	2002 Statewide Use Rank	2002 Statewide Use (lbs)	Volatility	DPR Risk Assessment Priority	Monitor Method	Use Rating	Volatility Rating	Risk Assess Rating	Total Rating	TAC	Prop 65
PETROLEUM DISTILLATES, REFINED	60	276,457	High			2	4	1	7	no	no
PETROLEUM OIL, UNCLASSIFIED	2	17,673,122	Low			4	2	1	7	no	no
SODIUM CHLORATE	12	2,385,103	Low			4	2	1	7	no	no
SULFUR	1	53,614,583	Low		ARB-metal	4	2	1	7	no	no
SULFUR DIOXIDE	75	190,362	High		ARB-single	2	4	1	7	no	no
ALUMINUM PHOSPHIDE	84	165,230	High			1	4	1	6	yes	no
CARBON DIOXIDE	91	137,057	High			1	4	1	6	no	no
DISODIUM OCTABORATE TETRAHYDRATE	26	846,422	Low			3	2	1	6	no	no
EPTC	63	253,887	Med		DPR-Lompoc add	2	3	1	6	no	no
FOSETYL-AL	58	298,150	Low	Low	Unsuccessful	2	2	2	6	no	no
GLYPHOSATE-TRIMESIUM	90	147,402	Low	Med		1	2	3	6	no	no
HYDROGEN CYANAMIDE	77	188,376	High			1	4	1	6	no	no
LIME-SULFUR	28	761,536	Low			3	2	1	6	no	no
OLEIC ACID, METHYL ESTER	71	212,198	Med			2	3	1	6	no	no
PROMETRYN	82	176,882	Med	Low		1	3	2	6	no	no
UREA DIHYDROGEN SULFATE	34	589,897	Low			3	2	1	6	no	no
ALKYLARYL POLY(OXYETHYLENE) GLYCOL	40	501,085				3	1	1	5	no	no
ARSENIC PENTOXIDE	67	233,506	Low			2	2	1	5	yes	yes
CHROMIC ACID	53	326,645	Low			2	2	1	5	yes	no
COPPER OXIDE (OUS)	68	229,214	Low		ARB-metal	2	2	1	5	no	no
GLYPHOSATE	86	157,872	Low	Low		1	2	2	5	no	no
KAOLIN	43	438,548				3	1	1	5	no	no
MOLASSES	99	108,567	Low			1	3	1	5	no	no
PETROLEUM OIL, PARAFFIN BASED	51	343,916	Low			2	2	1	5	no	no

Key to Pesticide Candidate Ratings

Statewide Use (DPR Pesticide Use Report Database)

4 = 852,435 - 53,614,583 lbs during 2002 (top 25 pesticides)
3 = 347,377 - 846,422 lbs during 2002 (2nd 25 pesticides)
2 = 190,149 - 343,916 lbs during 2002 (3rd 25 pesticides)
1 = 108,518 - 188,376 lbs during 2002 (4th 25 pesticides)

Volatility (DPR Pesticide Chemistry Database)

4 = $>10^{-2}$ mm Hg (high)
3 = 10^{-6} - 10^{-2} mm Hg (medium)
2 = $<10^{-6}$ mm Hg (low)
1 = volatility unknown

DPR Risk Assessment Priority (SB950 – Birth Defect Prevention Act report)

4 = high priority
3 = medium priority
2 = low priority
1 = no priority assigned

Monitor Method

DPR-Single = DPR/CDFA has a validated method as a single analyte
DPR-Lompoc = Pesticide included in DPR's multi-chemical method for the Lompoc project
DPR-Lompoc add = CDFA attempting to add to the Lompoc method
ARB-VOC = Pesticide included in ARB's standard volatile organic compound method
ARB-Metal = Pesticide included in ARB's standard metal method
ARB-Single = ARB has a validated method as a single analyte
Unsuccessful = Previous attempts to develop a method were unsuccessful
Blanks indicate that neither DPR or ARB have attempted to monitor

TAC

yes = listed as a toxic air contaminant
no = not listed as a toxic air contaminant

Prop 65 - pesticides that cause cancer or reproductive effects

yes = listed under Proposition 65
no = not listed under Proposition 65
some = some uses listed under Proposition 65
yes/no = parent compound is listed, but the primary breakdown product is not, or vice versa

Table 2. Community candidates for DPR's environmental justice pilot project. Each category is rated one to four (with a few zeros), with four representing the higher priority for monitoring (see the following key for the values associated with each rating). Total Rating represents the sum of the average environmental justice community rating, average cumulative impact data rating, and average pesticide density rating.

Community	Child Population Rating	Non-white Population Rating	Income Rating	Drift Illness Rating	Avg EJ Community Rating	Well Monitoring Rating	Air Monitoring Rating	Avg Cumulative Impact Data Rating	Regional OP Rating	Regional Fumigant Rating	Regional Sulfur-Copper Rating	Regional Other Pesticide Rating	Local OP Rating	Local Fumigant Rating	Local Sulfur-Copper Rating	Local Other Pesticide Rating	Avg Pesticide Density Rating	Total Rating
Parlier	4	4	4	0	3.0	4	3	3.5	4	4	4	2	4	4	4	2	3.5	10.0
Visalia	3	1	1	4	2.3	3	4	3.5	3	3	2	3	3	3	2	2	2.6	8.4
Arvin	3	3	4	4	3.5	1	2	2.5	3	4	4	2	3	4	4	3	3.4	8.4
OrangeCove	4	4	4	0	3.0	4	0	2.0	4	3	2	4	4	1	3	4	3.1	8.1
London	3	2	4	0	2.3	4	0	2.0	4	4	3	3	4	4	4	4	3.8	8.0
Cutler	4	3	4	0	2.8	3	0	1.5	4	3	3	4	4	4	3	3	3.5	7.8
Reedley	4	2	1	2	2.3	4	0	2.0	4	4	3	3	4	4	3	2	3.4	7.6
Farmersville	4	3	3	0	2.5	4	0	2.0	4	3	2	4	4	4	2	2	3.1	7.6
Orosi	3	4	3	0	2.5	3	0	1.5	4	3	3	4	4	3	3	4	3.5	7.5
Sanger	4	2	2	0	2.0	4	0	2.0	4	3	4	3	4	3	4	3	3.5	7.5
Selma	4	3	2	0	2.3	4	0	2.0	4	4	4	2	3	3	4	2	3.3	7.5
Ivanhoe	3	3	3	0	2.3	4	0	2.0	4	2	2	4	4	3	2	4	3.1	7.4
Dinuba	4	2	2	1	2.3	3	0	1.5	4	4	3	4	4	4	3	2	3.5	7.3
Traver	1	2	4	0	1.8	4	0	2.0	4	3	3	4	4	4	3	3	3.5	7.3
Exeter	4	1	1	2	2.0	4	0	2.0	4	2	2	4	4	3	3	4	3.3	7.3
Calwa	3	4	3	0	2.5	4	0	2.0	2	4	4	1	2	4	4	1	2.8	7.3
Woodlake	3	3	4	0	2.5	4	0	2.0	3	2	1	4	3	3	2	4	2.8	7.3
Madera	3	2	3	2	2.5	2	3	2.5	2	2	4	2	1	1	4	2	2.3	7.3
Fresno	4	2	2	0	2.0	2	4	3.0	2	2	4	2	1	3	3	1	2.3	7.3
Kingsburg	3	1	1	0	1.3	4	0	2.0	4	4	4	3	4	4	4	4	3.9	7.1
Poplar	2	4	3	0	2.3	4	0	2.0	3	3	2	4	2	4	2	3	2.9	7.1
Lindsay	4	3	4	0	2.8	3	0	1.5	4	0	2	4	4	0	3	4	2.6	6.9
Huron	4	4	4	0	3.0	0	0	0.0	4	4	4	4	4	3	3	3	3.6	6.6
Strathmore	2	3	3	0	2.0	4	0	2.0	4	1	1	4	4	0	3	4	2.6	6.6
Earlimart	4	4	4	4	4.0	0	0	0.0	2	2	4	1	2	3	4	2	2.5	6.5
Mendota	4	4	4	0	3.0	2	0	1.0	3	3	3	3	3	0	2	3	2.5	6.5
Clovis	3	1	1	1	1.5	3	4	3.5	1	2	2	1	1	2	1	1	1.4	6.4
Del Rey	1	2	3	0	1.5	4	0	2.0	4	3	4	1	3	2	4	1	2.8	6.3
Fowler	2	3	1	0	1.5	4	0	2.0	3	4	4	1	2	3	4	1	2.8	6.3
Parksdale	2	4	3	0	2.3	4	0	2.0	1	2	4	2	1	0	4	2	2.0	6.3
Richgrove	4	4	4	0	3.0	0	0	0.0	4	1	4	4	4	0	4	4	3.1	6.1
Woodville	1	4	4	0	2.3	3	0	1.5	2	3	1	3	2	3	2	3	2.4	6.1
Merced	3	2	2	0	1.8	2	2	2.0	2	2	2	4	2	1	2	4	2.4	6.1
Easton	1	2	2	0	1.3	4	0	2.0	2	3	4	1	2	4	4	2	2.8	6.0
Parkwood	2	3	2	0	1.8	4	0	2.0	1	2	4	2	3	0	4	2	2.3	6.0
Bowles	1	3	1	0	1.3	4	0	2.0	2	3	4	1	2	3	4	2	2.6	5.9
Winton	3	3	3	0	2.3	3	0	1.5	1	4	2	1	1	4	2	1	2.0	5.8
Terra Bella	3	4	4	0	2.8	1	0	0.5	3	1	3	4	2	0	2	4	2.4	5.6

Community	Child Population Rating	Non-white Population Rating	Income Rating	Drift Illness Rating	Avg EJ Community Rating	Well Monitoring Rating	Air Monitoring Rating	Avg Cumulative Impact Data Rating	Regional OP Rating	Regional Fumigant Rating	Regional Sulfur-Copper Rating	Regional Other Pesticide Rating	Local OP Rating	Local Fumigant Rating	Local Sulfur-Copper Rating	Local Other Pesticide Rating	Avg Pesticide Density Rating	Total Rating
Planada	3	4	4	0	2.8	3	0	1.5	2	2	1	1	3	0	1	1	1.4	5.6
Ducor	2	4	3	0	2.3	2	0	1.0	3	1	4	4	1	0	1	4	2.3	5.5
Tulare	3	2	1	0	1.5	3	0	1.5	2	3	1	3	3	3	2	3	2.5	5.5
Firebaugh	2	3	2	0	1.8	3	0	1.5	1	2	2	3	3	0	3	4	2.3	5.5
Goshen	2	1	3	0	1.5	4	0	2.0	3	2	2	3	2	0	1	3	2.0	5.5
Livingston	3	3	2	0	2.0	2	0	1.0	1	4	3	1	1	4	3	1	2.3	5.3
Grayson	1	2	1	0	1.0	3	0	0.0	3	3	2	2	3	3	2	3	2.6	5.1
Cantua Cr	1	3	3	0	1.8	0	0	0.0	2	4	3	3	3	4	4	4	3.4	5.1
Kerman	4	3	2	0	2.3	0	0	0.0	2	4	4	2	2	3	4	2	2.9	5.1
Biola	2	4	3	0	2.3	0	0	0.0	1	3	4	3	1	3	4	3	2.8	5.0
Porterville	3	2	2	1	2.0	1	0	0.5	3	2	2	4	2	1	2	4	2.5	5.0
Raisin City	1	1	4	0	1.5	1	0	0.5	3	3	4	2	2	2	4	3	2.9	4.9
Avenal	1	3	3	4	2.8	0	0	0.0	1	4	2	1	1	4	2	1	2.0	4.8
San Joaquin	4	3	4	0	2.8	0	0	0.0	3	3	2	2	4	0	0	2	2.0	4.8
LemonCove	1	1	2	0	1.0	4	0	2.0	2	1	1	3	1	0	2	4	1.8	4.8
LemooreSta	2	1	3	0	1.5	0	0	0.0	4	4	2	3	3	3	3	3	3.1	4.6
Caruthers	2	2	1	0	1.3	1	0	0.5	3	3	4	3	3	0	4	2	2.8	4.5
Pixley	1	4	4	0	2.3	1	0	0.5	2	2	2	1	1	3	2	1	1.8	4.5
Corcoran	2	4	2	0	2.0	0	2	1.0	2	0	1	3	2	0	1	3	1.5	4.5
Delhi	2	2	1	0	1.3	1	0	0.5	2	4	3	1	2	4	3	2	2.6	4.4
Atwater	4	2	1	0	1.8	1	0	0.5	1	4	1	3	1	4	2	1	2.1	4.4
Madera Ac	2	1	1	0	1.0	3	0	1.5	2	2	4	2	1	0	3	1	1.9	4.4
Los Banos	3	1	1	0	1.3	3	0	1.5	1	2	1	3	1	0	2	3	1.6	4.4
Tranquillity	2	3	1	0	1.5	0	0	0.0	3	3	3	2	4	0	3	4	2.8	4.3
Laton	1	3	2	0	1.5	0	0	0.0	4	2	3	2	4	2	2	2	2.6	4.1
Lanare	1	4	3	0	2.0	0	0	0.0	3	2	3	3	2	0	1	3	2.1	4.1
Home Gard	3	3	4	0	2.5	0	0	0.0	3	1	1	3	1	0	1	3	1.6	4.1
KettlemanC	4	4	4	0	3.0	0	0	0.0	1	4	1	1	1	0	0	1	1.1	4.1
Tipton	2	4	3	0	2.3	2	0	1.0	1	0	1	2	1	0	1	1	0.9	4.1
S Dos Palos	1	2	4	0	1.8	0	0	0.0	1	1	2	4	3	0	3	4	2.3	4.0
Chowchilla	1	1	2	0	1.0	0	0	0.0	2	2	3	2	3	3	3	3	2.6	3.6
Le Grand	1	2	3	0	1.5	1	0	0.5	2	2	2	1	1	3	1	1	1.6	3.6
Dos Palos	3	1	2	0	1.5	0	0	0.0	1	1	3	4	2	0	2	3	2.0	3.5
Riverdale	1	2	3	0	1.5	0	0	0.0	3	1	3	2	2	0	2	3	2.0	3.5
Stratford	3	3	2	0	2.0	0	0	0.0	3	1	1	1	3	2	0	1	1.5	3.5
Hilmar	1	1	1	0	0.8	1	0	0.5	1	4	3	1	2	4	2	1	2.3	3.5
Hanford	3	1	1	1	1.5	0	0	0.0	3	1	1	3	3	0	1	3	1.9	3.4
Armona	2	1	2	0	1.3	0	0	0.0	3	1	1	2	3	2	1	1	1.8	3.0
Gustine	3	1	1	0	1.3	0	0	0.0	1	2	1	1	3	2	1	2	1.6	2.9
Lemoore	3	1	1	0	1.3	0	0	0.0	3	1	1	2	3	0	1	2	1.6	2.9
Alpaugh	1	2	4	0	1.8	0	0	0.0	1	0	1	3	2	0	0	2	1.1	2.9
Bonadelle	1	1	1	0	0.8	1	0	0.5	1	1	3	2	1	0	3	1	1.5	2.8
Coalinga	2	2	1	0	1.3	0	0	0.0	1	3	1	1	1	0	0	1	1.0	2.3
Friant	1	1	2	0	1.0	0	0	0.0	1	1	2	1	1	0	2	1	1.1	2.1

Key to Community Data

Environmental Justice Community Factors

Child Population Density (2000 Census)

4 = 1338 - 2969 children/mi2 (approx highest 20 communities)
3 = 788 - 1261 children/mi2 (approx 2nd 21 communities)
2 = 352 - 765 children/mi2 (approx 3rd 21 communities)
1 = 22 - 340 children/mi2 (approx lowest 21 communities)

Non-white Population Percentage (2000 Census)

4 = 65.5 - 91.1 percent (approx highest 20 communities)
3 = 52.8 - 65.0 percent (approx 2nd 21 communities)
2 = 42.1 - 52.4 percent (approx 3rd 21 communities)
1 = 6.9 - 41.5 percent (approx 21 lowest communities)

Median Family Income (2000 Census)

4 = 20,524 - 25,481 $/yr (approx lowest 20 communities)
3 = 26,166 - 32,470 $/yr (approx 2nd 21 communities)
2 = 32,852 - 37,033 $/yr (approx 3rd 21 communities)
1 = 37,979 - 86,653 $/yr (approx highest 21 communities)

Pesticide Illnesses (DPR Pesticide Illness Surveillance Program Database)

4 = 51 - 178 non-occupational drift illnesses during 1993 - 2002 (4 communities)
3 = no communities
2 = 13 - 16 non-occupational drift illnesses during 1993 - 2002 (3 communities)
1 = 2 - 7 non-occupational drift illnesses during 1993 - 2002 (4 communities)
0 = no non-occupational drift illnesses during 1993 - 2002 (72 communities)

Availability of Data for Cumulative Impact Evaluation

Municipal Well Monitoring Density (DPR Well Inventory Database)

4 = 28.3 - 1322 wells x pesticides sampled/mi2 during 1999 - 2004 (23 communities)
3 = 8.5 - 24.6 wells x pesticides sampled/mi2 during 1999 - 2004 (14 communities)
2 = 5.7 - 7.2 wells x pesticides sampled/mi2 during 1999 - 2004 (7 communities)
1 = 0.5 - 4.6 wells x pesticides sampled/mi2 during 1999 - 2004 (11 communities)
0 = 0 wells sampled during 1999 - 2004 (28 communities)

Air Monitoring Stations (ARB and APCD)

4 = monitored for 5 - 6 criteria pollutants (3 communities)
3 = monitored for 3 - 4 criteria pollutants (1 community)
2 = monitored for 1 - 2 criteria pollutants (4 communities)
0 = not monitored for criteria pollutants (75 communities)

Pesticide Use

Regional Organophosphate Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 14 OPs within 5 miles of the community during 2002

4 = 274 - 796 lbs/mi2 (approx highest 20 communities)
3 = 157 - 247 lbs/mi2 (approx 2nd 21 communities)
2 = 93 - 155 lbs/mi2 (approx 3rd 21 communities)
1 = 9 - 88 lbs/mi2 (approx lowest 21 communities)

Regional Fumigant Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 4 fumigants within 5 miles of the community during 2002

4 = 1,148 - 12,649 lbs/mi2 (approx highest 20 communities)
3 = 359 - 1073 lbs/mi2 (approx 2nd 21 communities)
2 = 74 - 342 lbs/mi2 (approx 3rd 21 communities)
1 = 2 - 70 lbs/mi2 (approx lowest 21 communities)
0 = no use

Regional Sulfur and Copper Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported within 5 miles of the community during 2002

4 = 7927 - 22701 lbs/mi2 (approx highest 20 communities)
3 = 3109 - 6464 lbs/mi2 (approx 2nd 21 communities)
2 = 1467 - 2874 lbs/mi2 (approx 3rd 21 communities)
1 = 5 - 1377 lbs/mi2 (approx lowest 21 communities)

Regional Other Pesticide Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 13 other pesticides within 5 miles of the community during 2002

4 = 354 - 566 lbs/mi2 (approx highest 20 communities)
3 = 241 - 331 lbs/mi2 (approx 2nd 21 communities)
2 = 156 - 234 lbs/mi2 (approx 3rd 21 communities)
1 = 3 - 147 lbs/mi2 (approx lowest 21 communities)

Local Organophosphate Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 14 OPs within 1 mile of the community during 2002

4 = 288 - 1264 lbs/mi2 (approx highest 20 communities)
3 = 143 - 249 lbs/mi2 (approx 2nd 21 communities)
2 = 86 - 130 lbs/mi2 (approx 3rd 21 communities)
1 = 1 - 82 lbs/mi2 (approx lowest 21 communities)

Local Fumigant Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 4 fumigants within 1 mile of the community during 2002

4 = 1,485 - 15,893 lbs/mi2 (approx highest 20 communities)
3 = 268 - 1,404 lbs/mi2 (approx 2nd 21 communities)
2 = 93 - 225 lbs/mi2 (approx 3rd 21 communities)
1 = 20 - 39 lbs/mi2 (approx lowest 21 communities)
0 = no use

Local Sulfur and Copper Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported within 1 mile of the community during 2002

4 = 6,388 - 16,424 lbs/mi2 (approx highest 20 communities)
3 = 187 - 987 lbs/mi2 (approx 2nd lowest 21 communities)
2 = 93 - 143 lbs/mi2 (approx 3rd 21 communities)
1 = 10 - 616 lbs/mi2 (approx lowest 21 communities)
0 = no use

Local Other Pesticide Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 13 other pesticides within 1 mile of the community during 2002

4 = 387 - 1123 lbs/mi2 (approx highest 20 communities)
3 = 220 - 351 lbs/mi2 (approx 2nd 21 communities)
2 = 132 - 214 lbs/mi2 (approx 3rd 21 communities)
1 = 3 - 126 lbs/mi2 (approx lowest 21 communities)

Table 3. Environmental justice factors, availability of cumulative impact data, number of monitoring sites, and other factors for the leading community candidates. Each community is rated one to four (a few with zero) for each category, with four representing the higher priority for monitoring.

Community Characteristic	Arvin	Mendota	Parlier
Area (mi^2)	4.8	1.9	1.6
Population	12,994	7,891	11,088
Population density (people/mi^2)	2,707	4,153	6,930
Environmental justice factors			
Child population density (children/mi^2)	1,082	1,382	2,618
Child population rating	3	4	4
Non-white population percentage	55.7	75.1	65.5
Non-white population rating	3	4	4
Median family income ($/yr)	24,816	22,984	24,275
Income rating	4	4	4
Number of non-occupation drift illnesses	178	0	0
Drift illness rating	4	0	0
Average environmental justice rating	3.5	3.0	3.0
Availability of cumulative impact data			
Number of municipal wells sampled	3	1	37
Well density (#wells x #pesticides/mi^2)	4.0	6.4	202.6
Well monitoring rating	1	2	4
Number of criteria pollutants monitored	2 (ozone, NO_2)	0	3 (ozone, CO, NO_2)
Air monitoring rating	2	0	3
Average cumulative impact data rating	1.5	1.0	3.5
Monitoring sites			
Likely number of preferred sites[a]	1 or 2	2 or 3	4 or 5
Able to collect maximum number of samples	No	Yes	Yes
Other factors			
Other air monitoring	None	None	Dioxin
Community environmental health study	No	Yes	Maybe

[a] Preferred monitoring sites are schools or other "sensitive sites" on the edge of town that meet U.S. EPA ambient air siting criteria.

Table 4a. Regional (within five miles of the community) use density (pounds per square mile) of candidate pesticides for the leading candidate communities, 2002. Each community is rated one to four (a few with zero) for each category, with four representing the higher priority for monitoring.

Type of Pesticide	Pesticide	Arvin	Mendota	Parlier
Fumigant	1,3-DICHLOROPROPENE	1,624.6	242.9	1,590.6
	CHLOROPICRIN	334.5	0.0	29.2
	METAM-SODIUM	10,525.1	583.3	172.8
	METHYL BROMIDE	165.0	0.0	103.8
Fumigant Total		12,649.2	826.2	1,896.4
Fumigant Rating		4	3	4
Organophosphate	AZINPHOS-METHYL	8.3	0.0	5.8
	CHLORPYRIFOS	68.5	57.6	182.5
	DIAZINON	0.0	33.6	28.1
	DIMETHOATE	26.1	1.1	5.7
	MALATHION	2.3	5.9	7.4
	METHIDATHION	5.0	0.0	0.0
	METHYL PARATHION	0.0	0.0	1.5
	NALED	1.0	43.8	0.0
	OXYDEMETON-METHYL	0.0	5.4	0.0
	PARATHION	0.0	1.0	0.0
	PHORATE	21.1	5.1	0.0
	PHOSMET	10.3	0.0	267.6
	SSS-TRIBUTYLPHOSPHOROTRITHIOATE	1.8	43.4	0.0
Organophosphate Total		144.3	196.8	498.7
Organophosphate Rating		3	3	4
Other	(S)-METOLACHLOR	1.9	42.5	0.0
	CARBARYL	10.6	2.3	15.5
	CYPERMETHRIN	0.0	0.3	0.0
	DICOFOL	2.3	55.2	4.2
	DIURON	35.3	49.8	16.2
	EPTC	64.1	6.5	0.0
	OXYFLUORFEN	24.6	15.5	34.3
	PERMETHRIN	3.7	1.3	0.0
	SIMAZINE	45.8	7.6	94.2
	TRIFLURALIN	39.5	104.4	1.6
Other Total		227.9	285.4	166.2
Other Rating		2	3	2
Sulfur-Copper	COPPER	323.4	18.3	785.2
	SULFUR	5,081.4	4,138.1	7,607.0
Sulfur-Copper Total		5,404.8	4,156.4	8,392.2
Sulfur-Copper Rating		4	3	4
Regional Pesticide Rating		3.3	3.0	3.5
Average (Regional and Local) Pesticide Rating		3.4	2.5	3.5

NOTE: These communities had no use of the following candidate pesticides: disulfoton, molinate, propanil, and thiobencarb.

Table 4b. Local (within one mile of the community) use density (pounds per square mile) of candidate pesticides for the leading candidate communities, 2002. Each community is rated one to four (a few with zero) for each category, with four representing the higher priority for monitoring.

Type of Pesticide	Pesticide	Arvin	Mendota	Parlier
Fumigant	1,3-DICHLOROPROPENE	2,100.9	0.0	834.9
	CHLOROPICRIN	211.3	0.0	76.5
	METAM-SODIUM	13,326.1	0.0	508.0
	METHYL BROMIDE	255.2	0.0	217.7
Fumigant Total		15,893.4	0.0	1,637.2
Fumigant Rating		4	0	4
Organophosphate	AZINPHOS-METHYL	27.3	0.0	0.4
	CHLORPYRIFOS	95.9	30.2	236.9
	DIAZINON	0.0	0.0	21.9
	DIMETHOATE	41.3	6.2	0.6
	MALATHION	2.5	10.9	3.1
	METHIDATHION	22.6	0.0	0.0
	NALED	1.9	60.5	0.0
	OXYDEMETON-METHYL	0.1	0.0	0.0
	PARATHION	0.0	6.2	0.0
	PHORATE	31.9	2.3	0.0
	PHOSMET	24.3	0.0	482.9
	SSS-TRIBUTYLPHOSPHOROTRITHIOATE	1.1	64.3	0.0
Organophosphate Total		248.9	180.6	745.8
Organophosphate Rating		3	3	4
Other	(S)-METOLACHLOR	0.0	33.3	0.0
	CARBARYL	18.2	12.7	28.7
	CYPERMETHRIN	0.0	1.3	0.0
	DICOFOL	0.3	58.1	1.4
	DIURON	26.3	31.0	9.9
	EPTC	89.8	0.0	0.0
	OXYFLUORFEN	55.5	24.0	54.2
	PERMETHRIN	3.8	0.0	0.0
	SIMAZINE	63.5	0.0	92.0
	TRIFLURALIN	63.5	81.4	1.9
Other Total		321.0	241.8	188.0
Other Rating		3	3	2
Sulfur-Copper	COPPER	447.6	14.0	1,081.9
	SULFUR	8,213.9	985.1	6,840.0
Sulfur-Copper Total		8,661.5	999.1	7,921.9
Sulfur-Copper Rating		4	2	4
Local Pesticide Rating		3.5	2.0	3.5
Average (Regional and Local) Pesticide Rating		3.4	2.5	3.5

NOTE: These communities had no use of the following candidate pesticides: disulfoton, molinate, propanil, and thiobencarb.

Table 5. Regional (within five miles) use density (pounds per square mile) of candidate pesticides by crop/site for the leading candidate communities, 2002

Crop/Site	Arvin	Mendota	Parlier
ALFALFA	16.61	130.48	0.44
ALMOND	17.82	3.67	21.85
APPLE	4.98	0.00	19.60
APRICOT	3.31	0.00	12.72
BEAN, DRIED	0.23	1.20	0.00
BEAN, SUCCULENT	5.23	0.00	0.29
BEET	1.39	0.00	0.00
BLUEBERRY	0.00	0.00	1.17
BROCCOLI	0.00	139.20	0.00
CABBAGE	0.01	0.00	0.00
CANTALOUPE	0.00	324.53	0.00
CARROT	5,362.48	0.00	0.00
CELERY	0.97	0.00	0.00
CHERRY	14.04	0.00	11.43
CHRISTMAS TREE	0.00	0.00	0.01
CITRUS	0.00	0.00	8.51
CORN (FORAGE - FODDER)	3.01	0.00	0.00
CORN, HUMAN CONSUMPTION	0.00	47.47	0.00
COTTON	387.87	201.59	0.00
EGGPLANT	0.00	0.00	10.37
FIG	0.00	0.00	0.00
GAI LON	0.02	0.00	0.00
GARLIC	0.13	2.23	0.00
GRAPE	2,879.21	156.71	11,338.63
GRAPE, WINE	2,350.39	1,055.32	542.14
GRAPEFRUIT	5.36	0.00	0.62
KIWI	0.00	0.00	0.11
LEMON	0.90	0.00	0.00
LETTUCE, HEAD	0.01	0.00	0.00
LETTUCE, LEAF	0.01	0.00	0.00
MELON	0.00	46.73	0.00
NECTARINE	91.26	0.00	1,302.70
N-OUTDR PLANTS IN CONTAINERS	15.16	0.00	36.55
OAT	0.00	0.00	0.01
ONION, DRY	266.60	0.24	61.12
ONION, GREEN	0.04	0.00	0.00
ORANGE	149.02	0.00	18.99
PARSLEY	18.85	0.00	0.00
PASTURELAND	0.00	0.00	0.00
PEACH	149.45	0.00	1,208.44
PEAR	0.00	0.00	6.96
PEPPER, FRUITING	126.07	0.00	0.00
Crop/Site	**Arvin**	**Mendota**	**Parlier**

PERSIMMON	0.00	0.00	0.31
PISTACHIO	6.44	5.01	7.15
PLUM	2.98	0.00	245.64
POMEGRANATE	0.00	280.34	0.00
POTATO	5,387.62	0.00	0.00
PRUNE	0.00	0.00	6.92
RESEARCH COMMODITY	0.00	0.00	0.00
RIGHTS OF WAY	0.00	0.00	0.03
SAFFLOWER	0.00	0.00	0.00
SOIL FUMIGATION/PREPLANT	0.00	0.00	999.59
SUGARBEET	0.00	44.01	0.00
TANGERINE	2.36	0.00	0.86
TOMATO	0.00	12.52	0.00
TOMATO, PROCESSING	239.46	1,871.23	0.00
TURF/SOD	0.00	0.00	0.53
UNCULTIVATED AG	0.19	0.59	0.35
WALNUT	45.37	0.00	11.22
WATER AREA	0.00	0.00	0.01
WATERMELON	259.81	0.00	0.00
WHEAT	63.22	1.95	0.00
Number of Crops/Sites	39	19	38

Table 6. Regional (within five miles of the community) pesticide use density (pounds/mi^2) for the leading candidate communities, 2001 – 2003.

Type of Pesticide	Year	Arvin	Mendota	Parlier
Fumigant	2001	4,803	704	1,897
	2002	12,649	826	1,896
	2003	11,166	2,205	2,016
Organophosphates	2001	122	275	494
	2002	144	197	499
	2003	143	235	408
Other	2001	179	253	185
	2002	228	285	166
	2003	202	222	135
Sulfur-Copper	2001	5,647	3,061	7,120
	2002	5,405	4,156	8,392
	2003	4,833	2,723	6,242

Figure 1. Locations of highly rated communities for DPR's environmental justice pilot project.

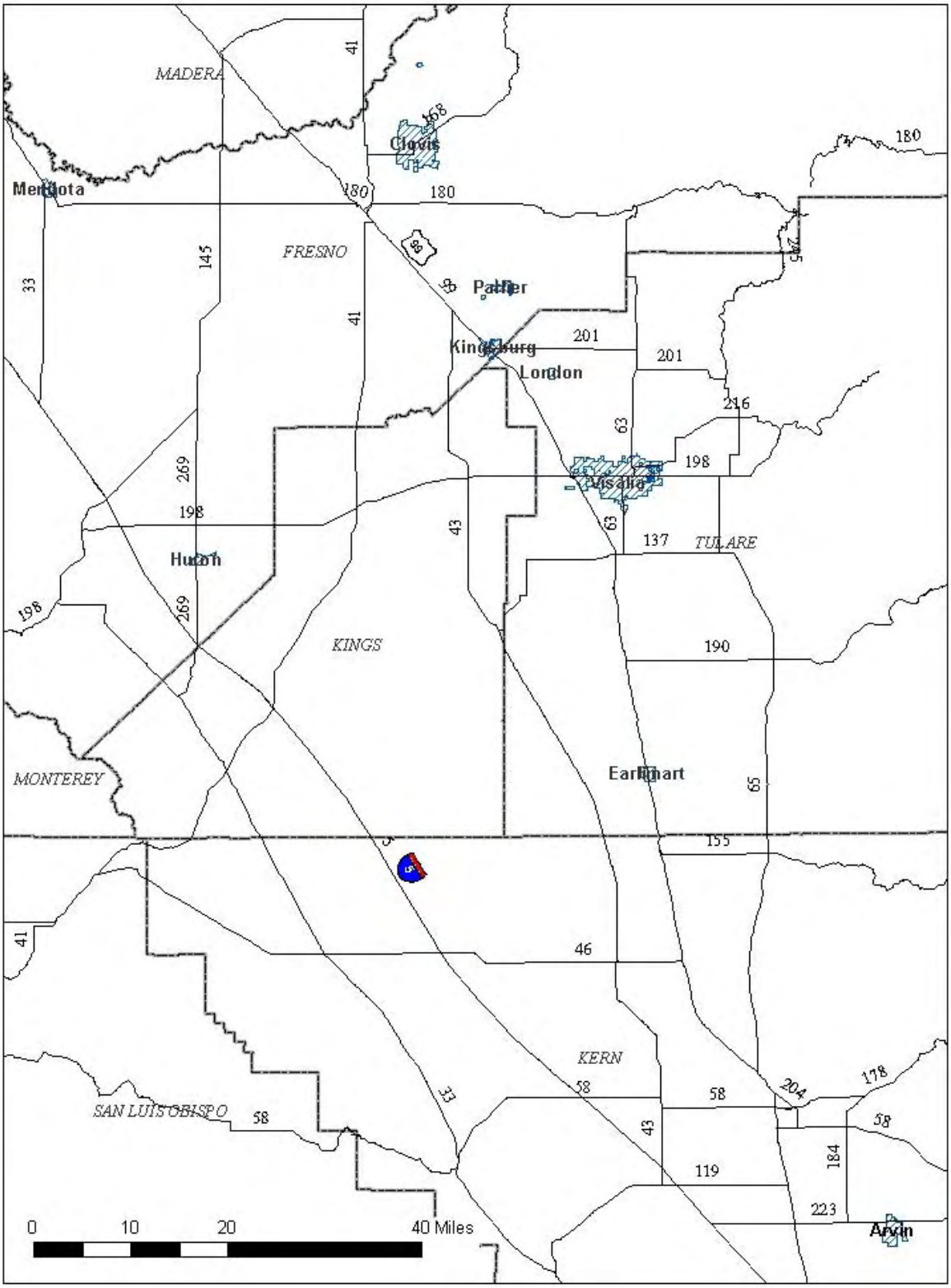


Figure 2. Wind speed at several high-rated communities, 1995 – 2004.

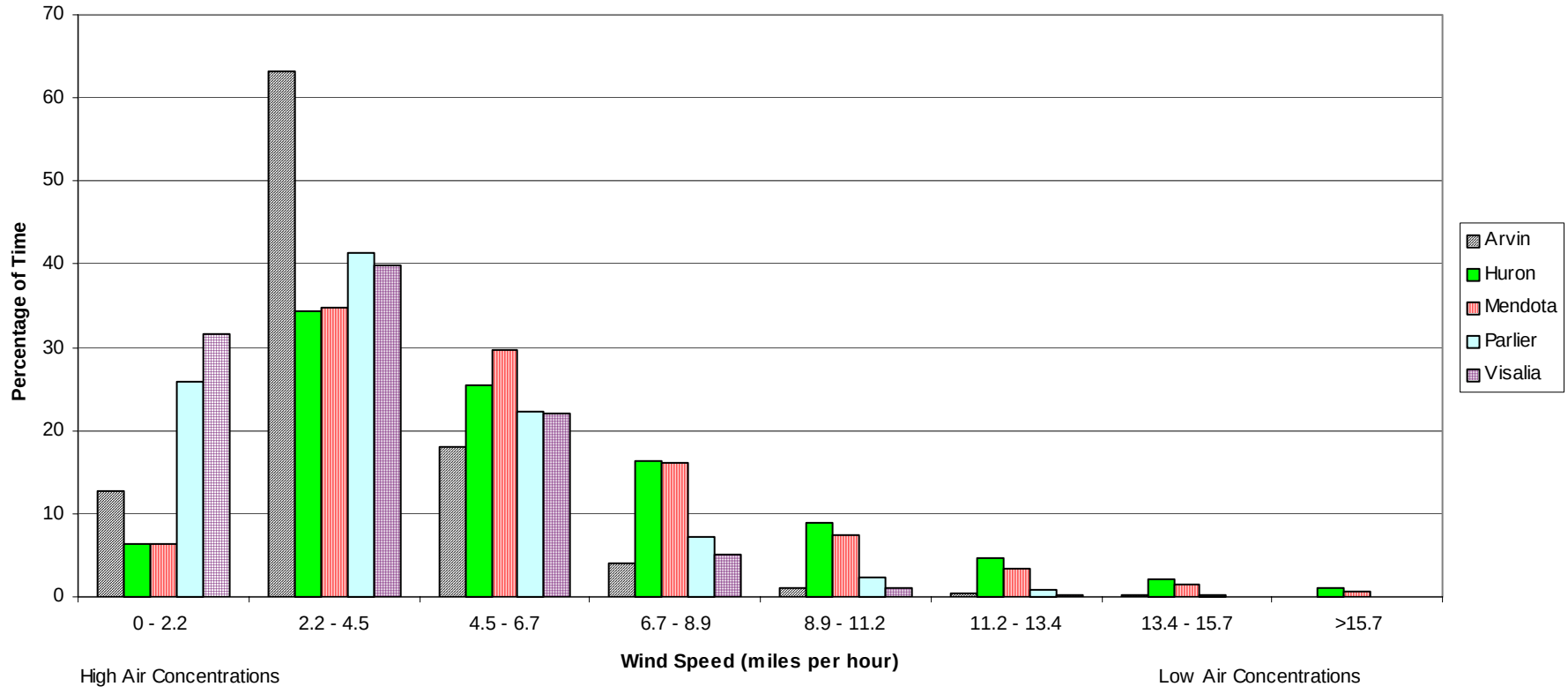


Figure 3. Wind direction at several high-rated communities, 1995 – 2004.

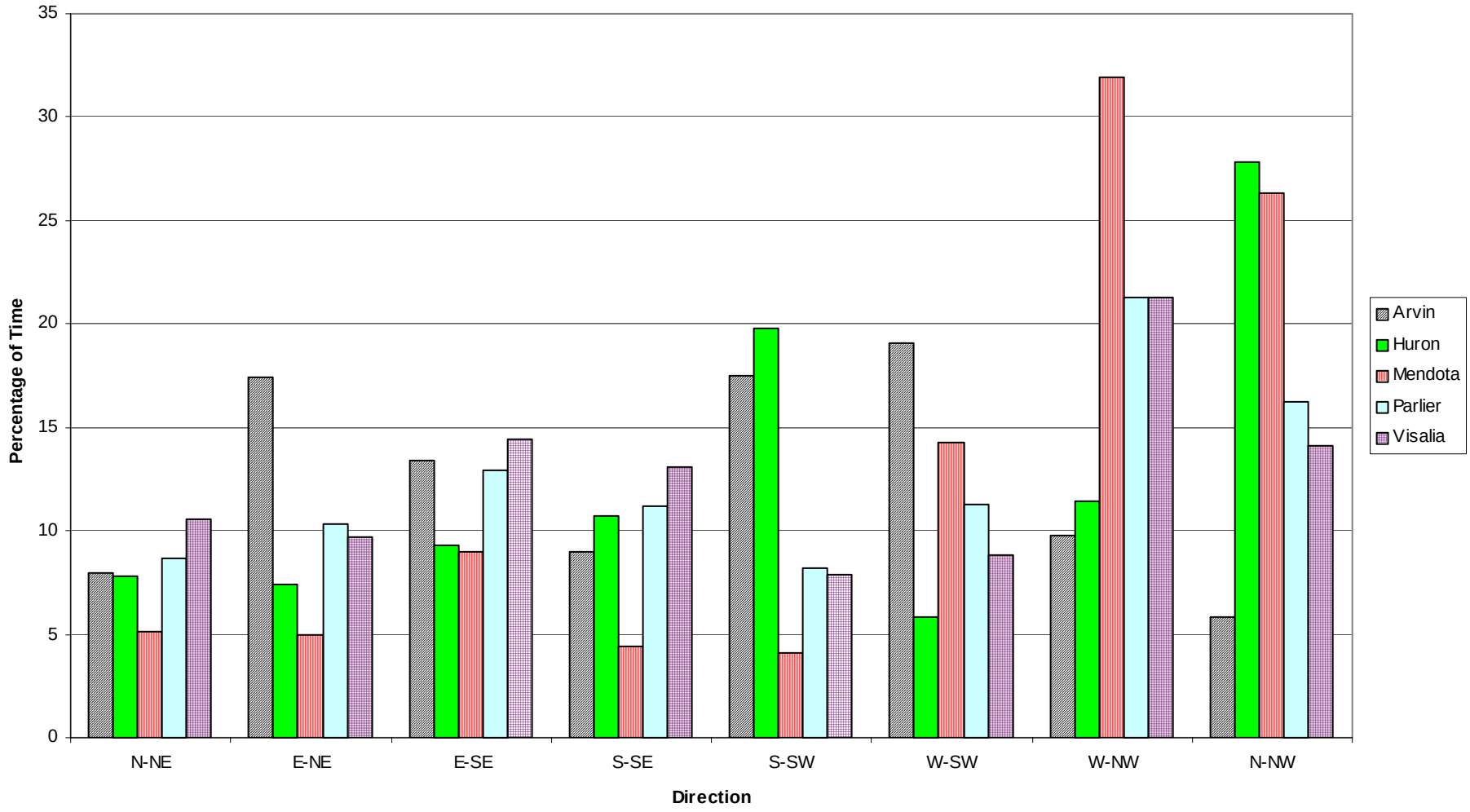
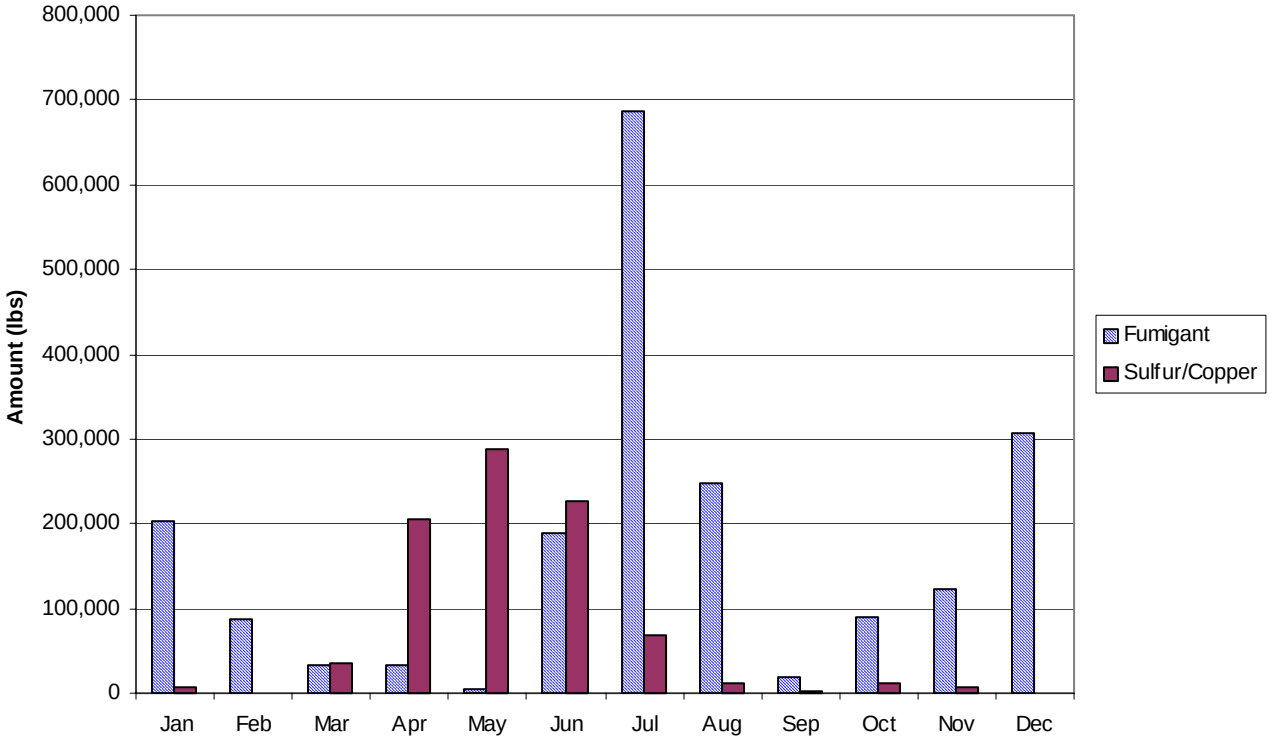


Figure 4. Regional (within five miles of community) use of pesticides for Arvin by month, 2002.



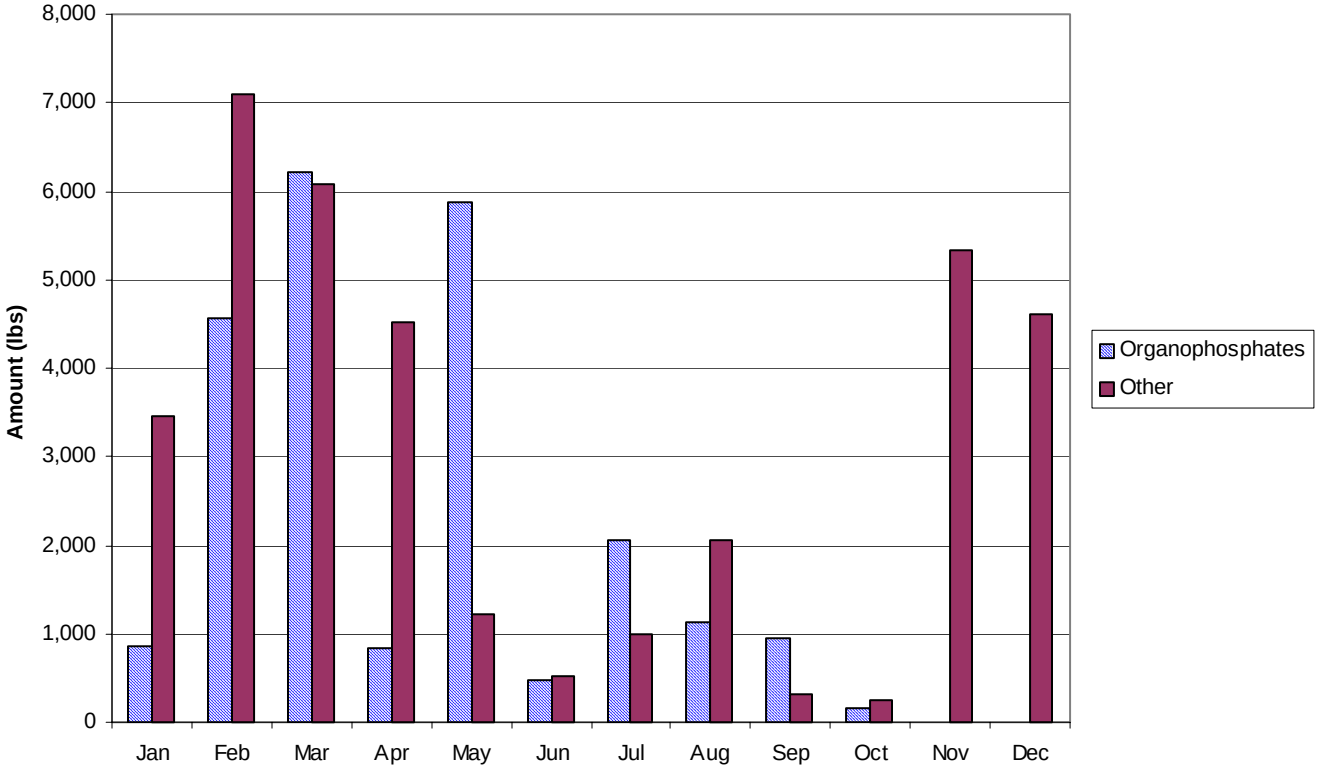


Figure 5. Regional (within five miles of community) use of pesticides for Mendota by month, 2002.

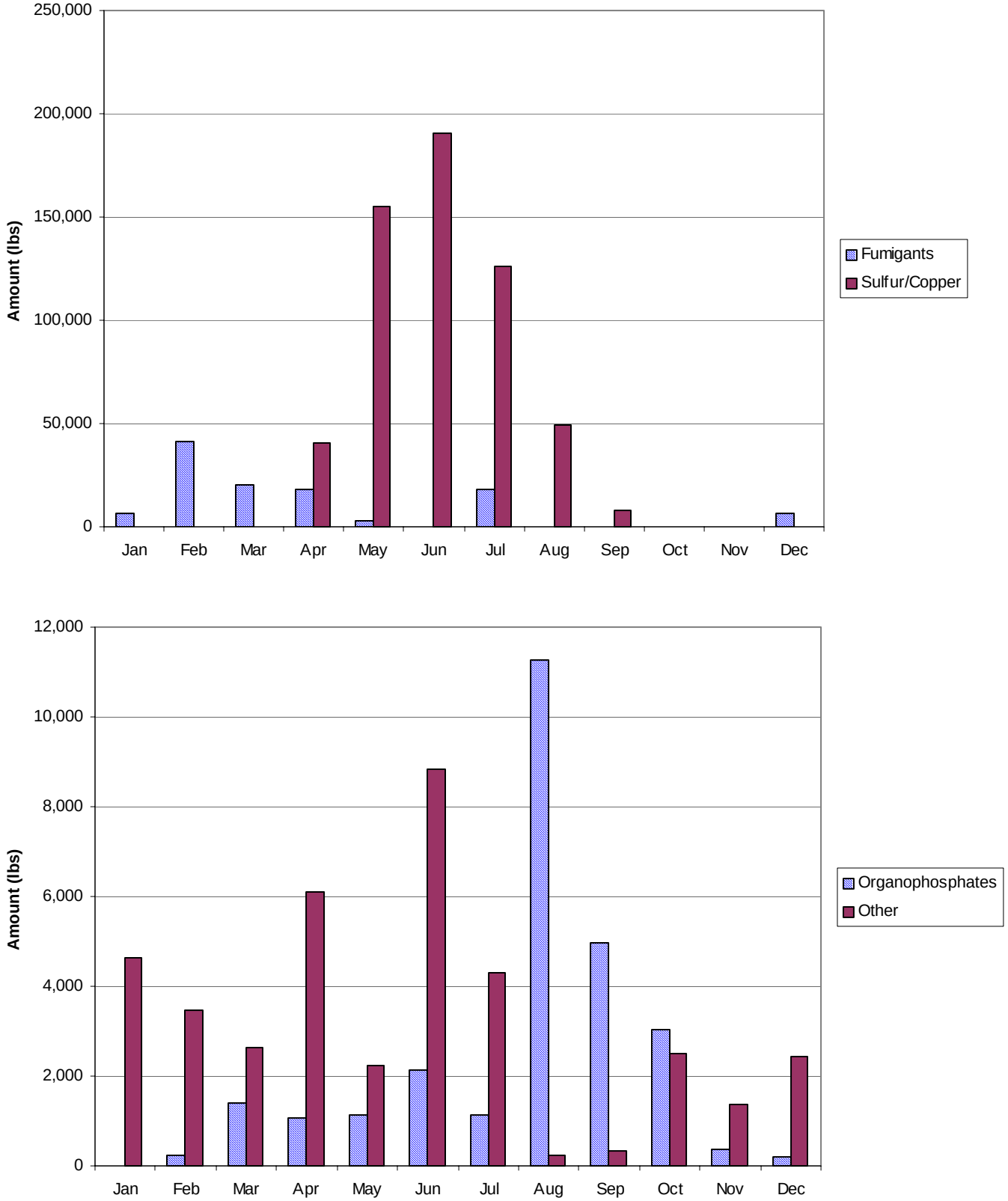
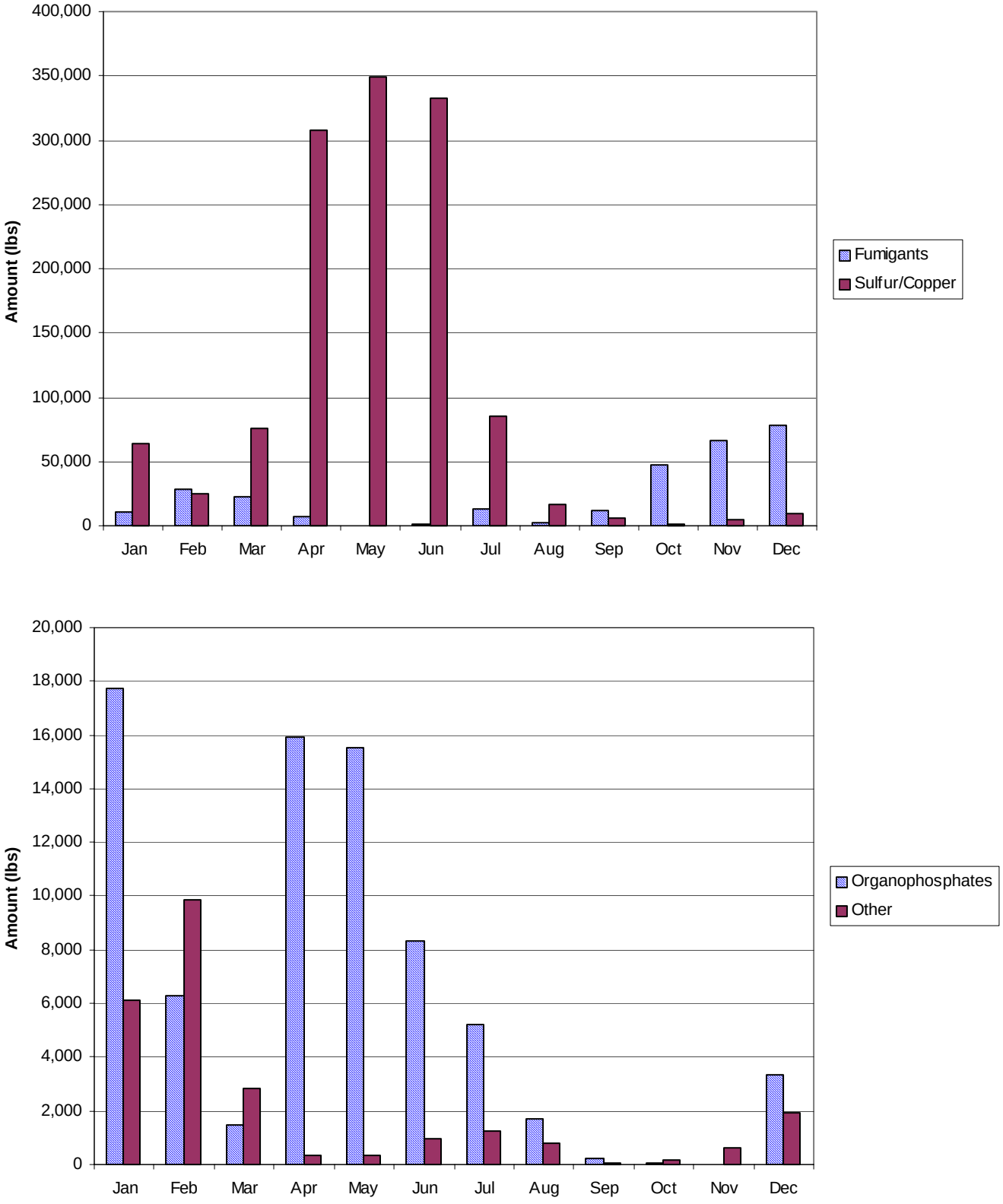
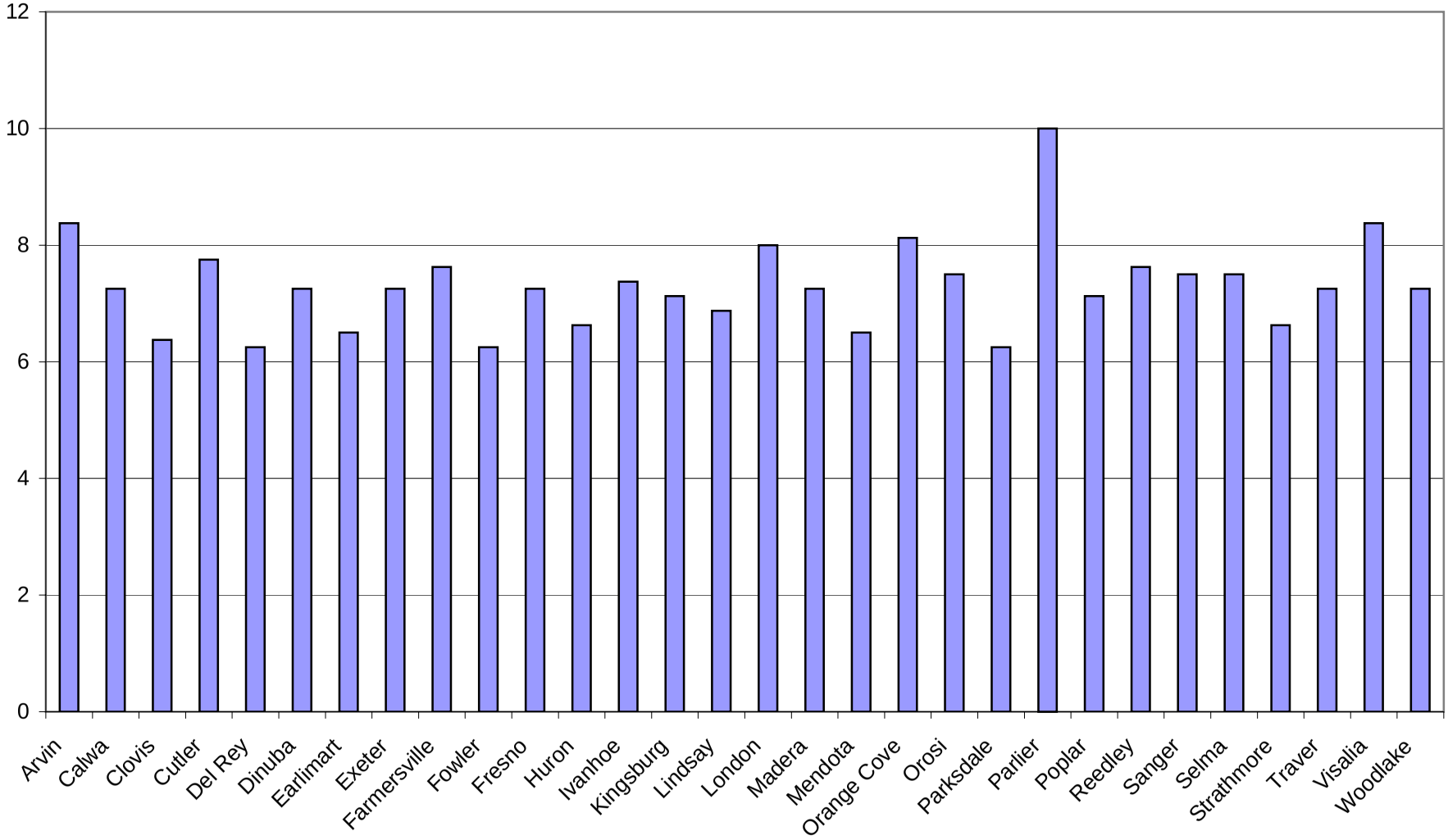


Figure 6. Regional (within five miles of community) use of pesticides for Parlier by month, 2002.

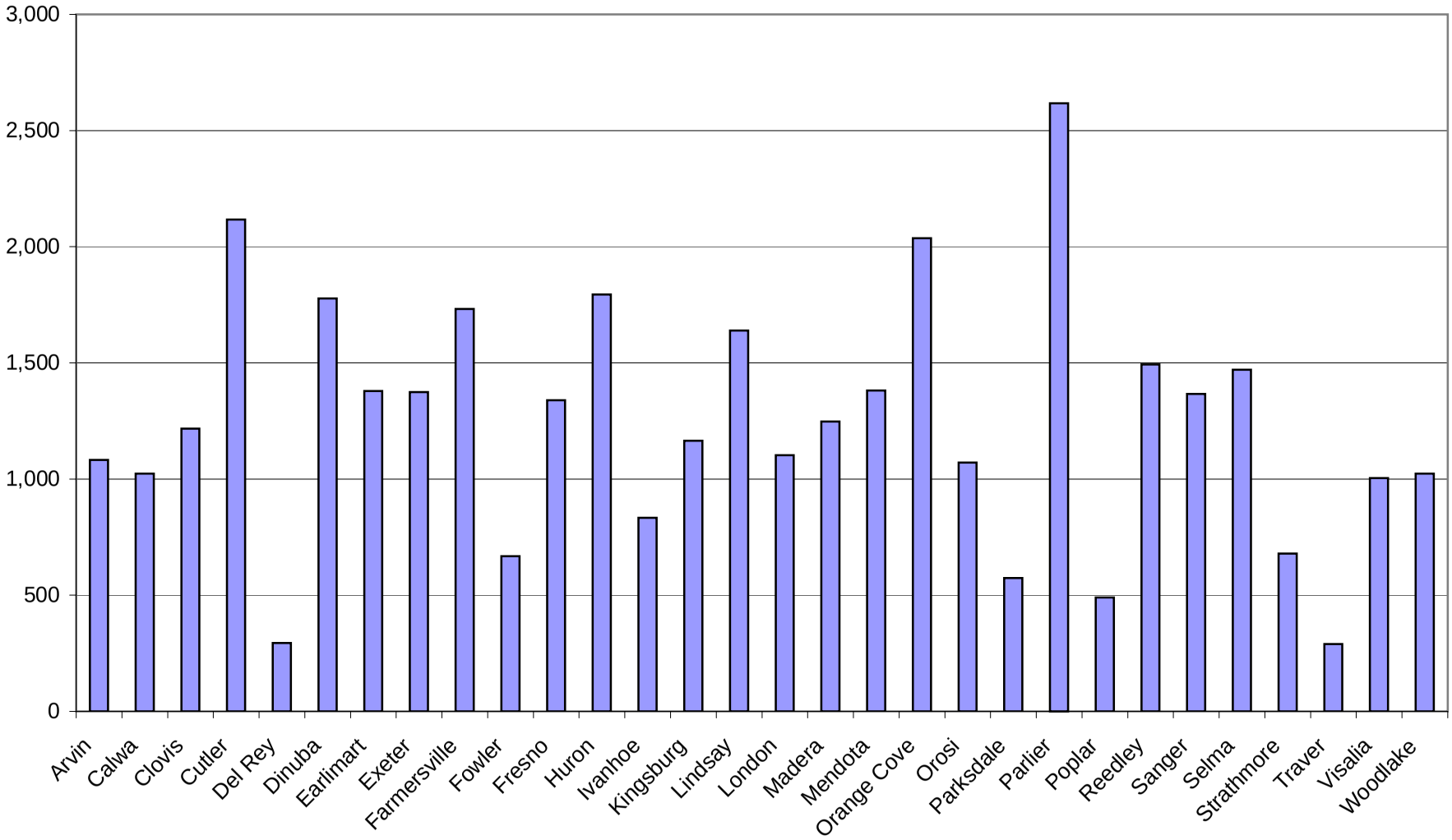


Appendix A

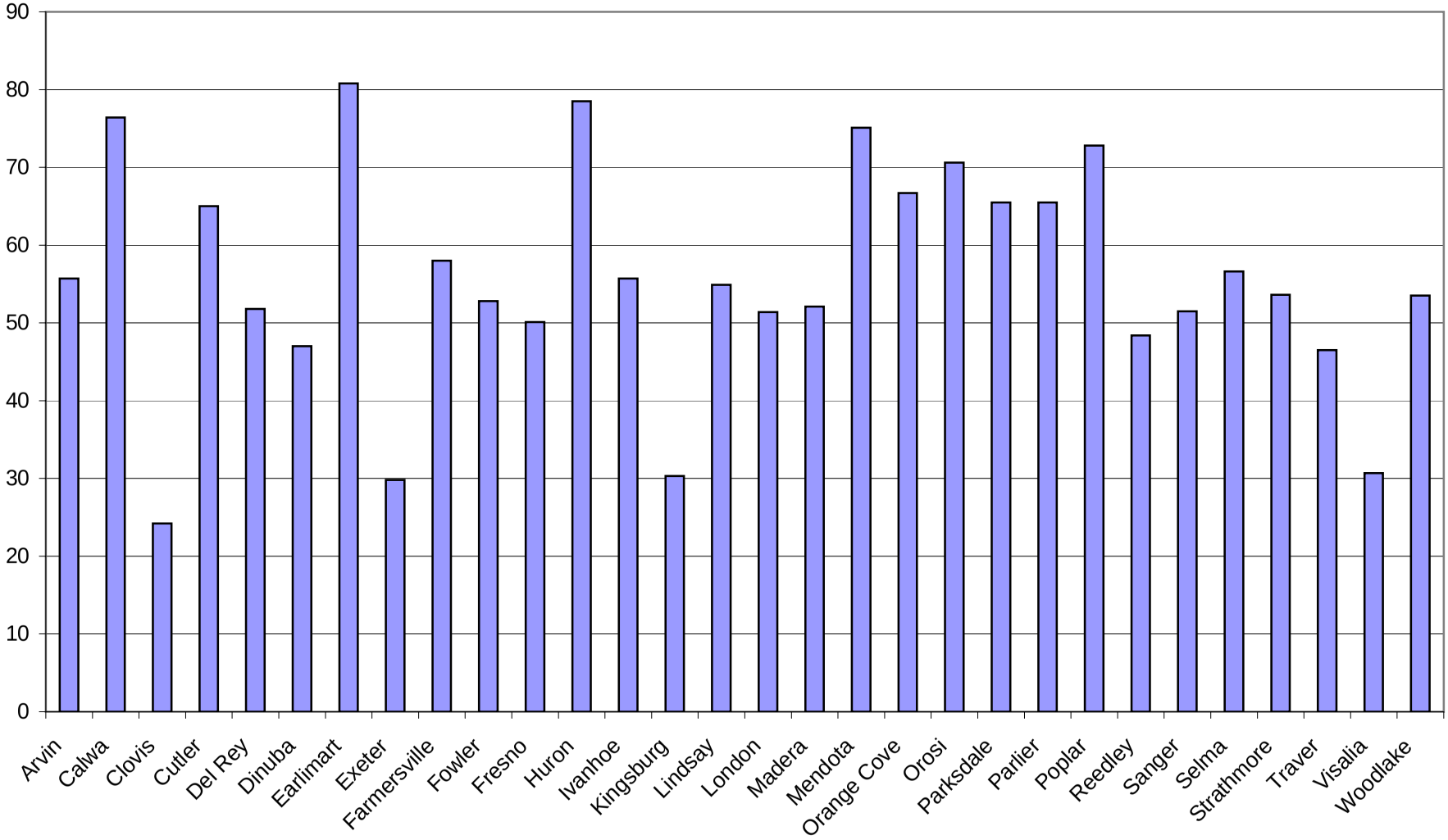
Department of Pesticide Regulation - Environmental Justice Pilot Project
Overall Ratings for Top 30 Communities



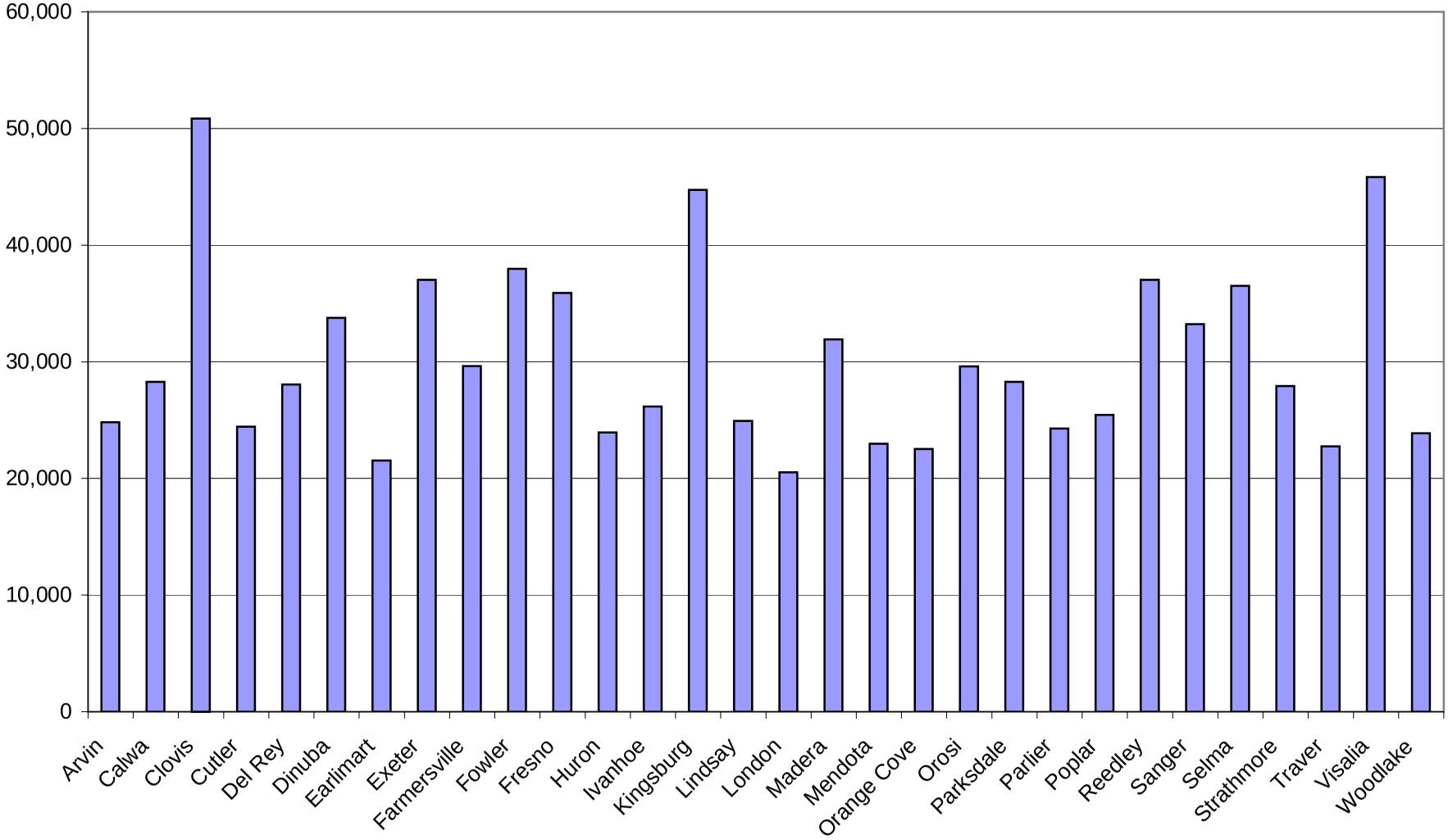
Department of Pesticide Regulation - Environmental Justice Pilot Project
Child Population Density (children/mi^2) for Top 30 Rated Communities Overall



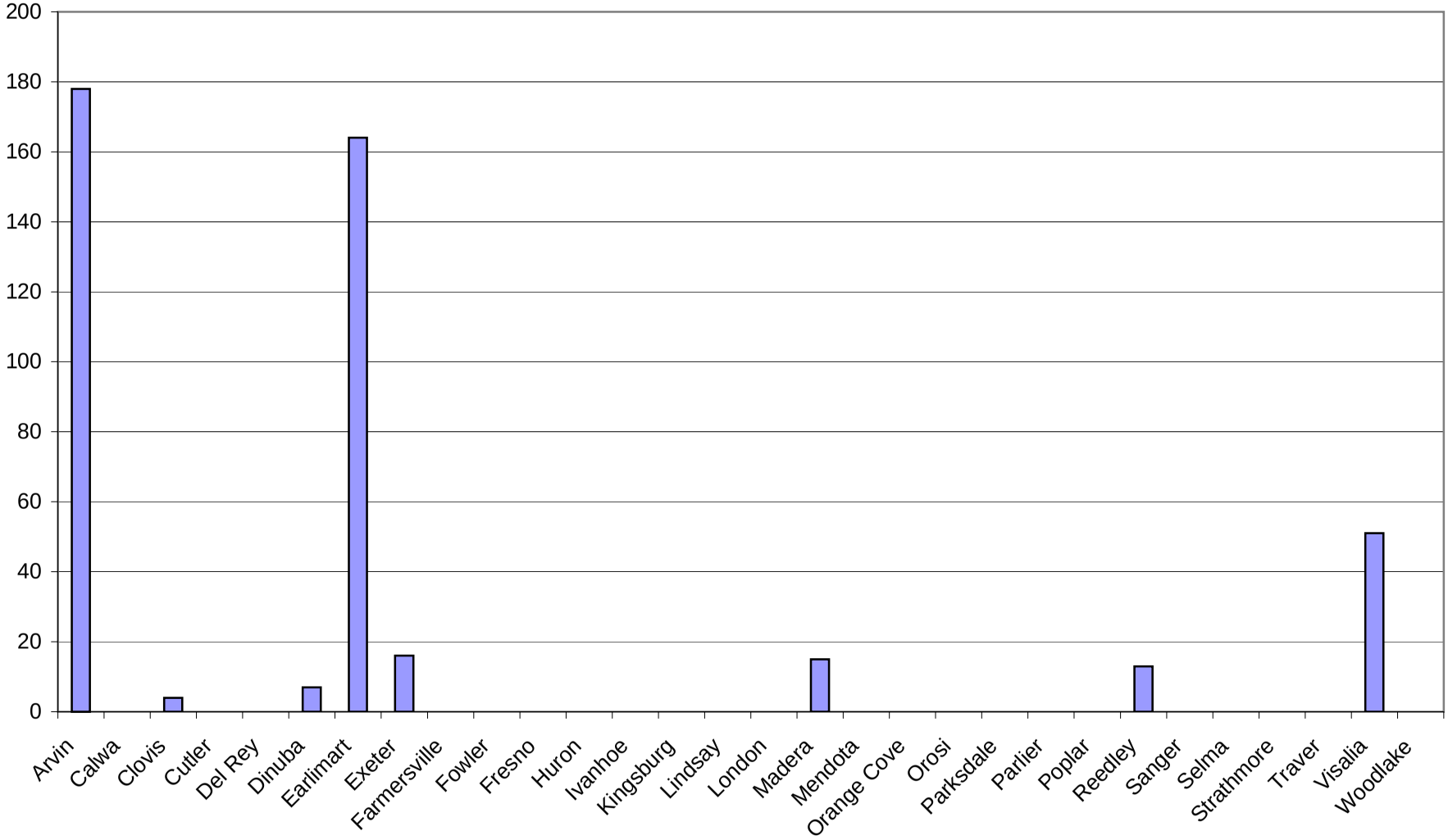
Department of Pesticide Regulation - Environmental Justice Pilot Project
Non-White Population (%) for Top 30 Rated Communities Overall



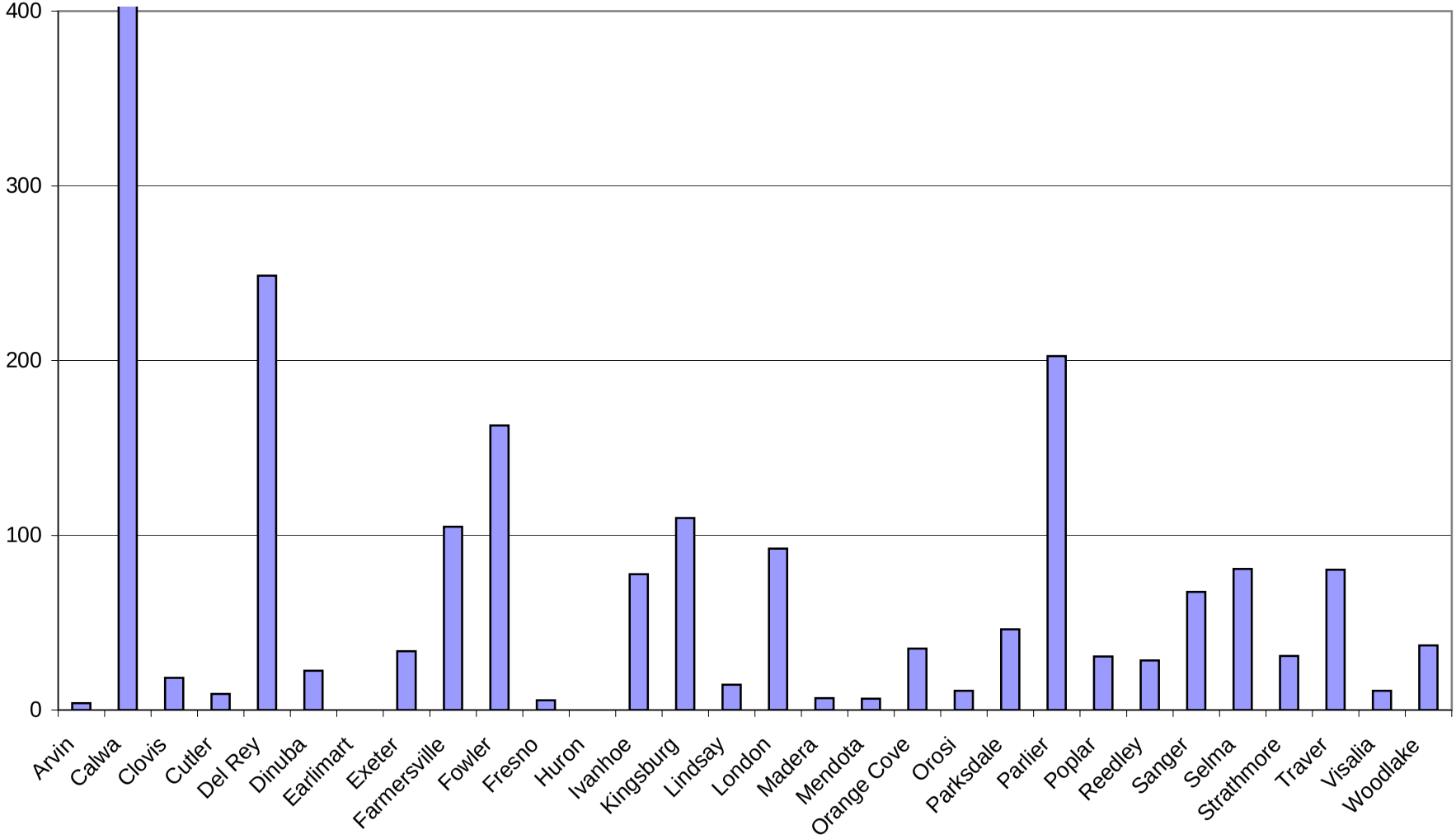
Department of Pesticide Regulation - Environmental Justice Pilot Project
Median Family Income ($/yr) for Top 30 Rated Communities Overall



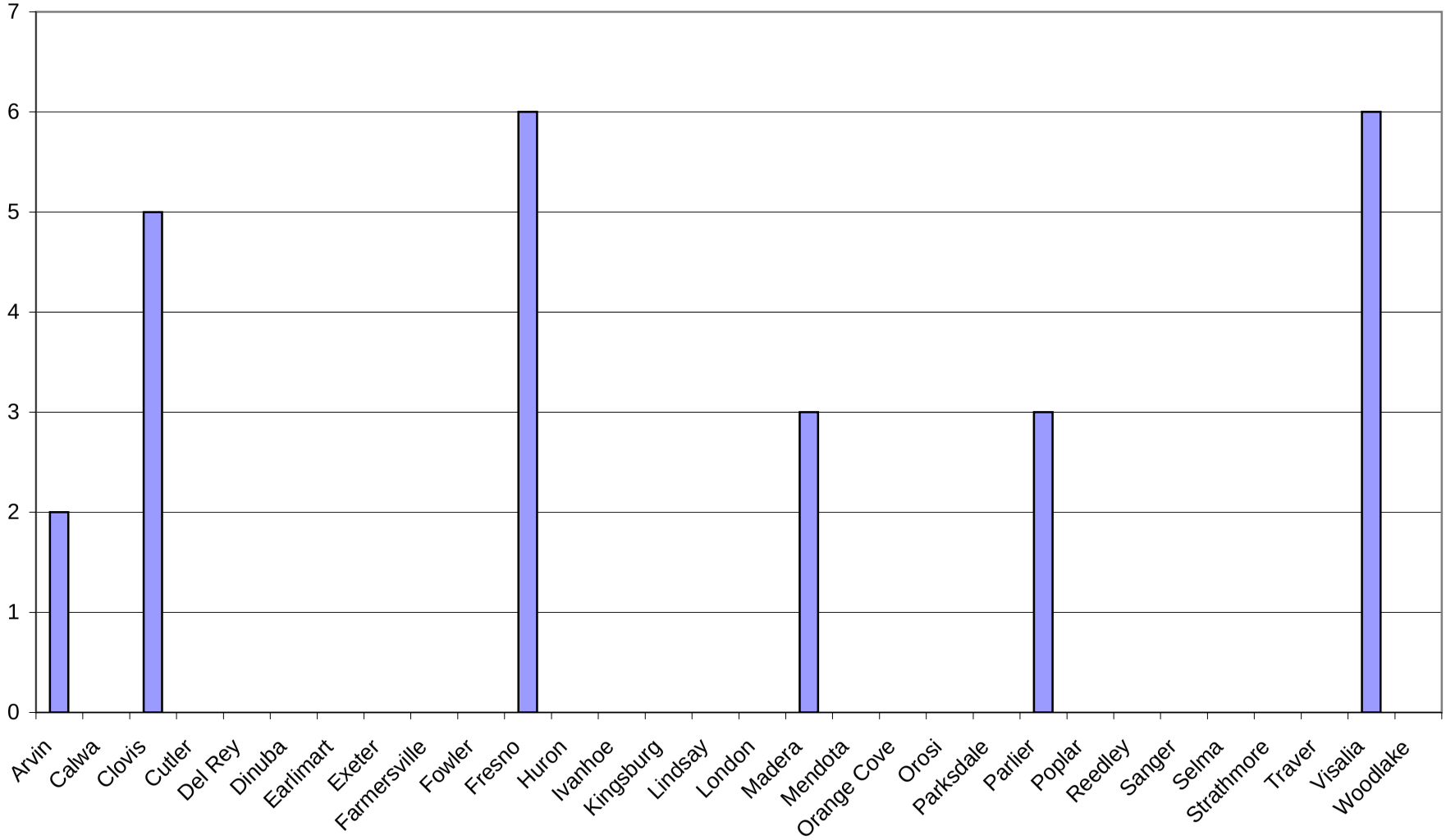
Department of Pesticide Regulation - Environmental Justice Pilot Project
Number of Drift Illnesses (1993-2002) for Top 30 Rated Communities Overall



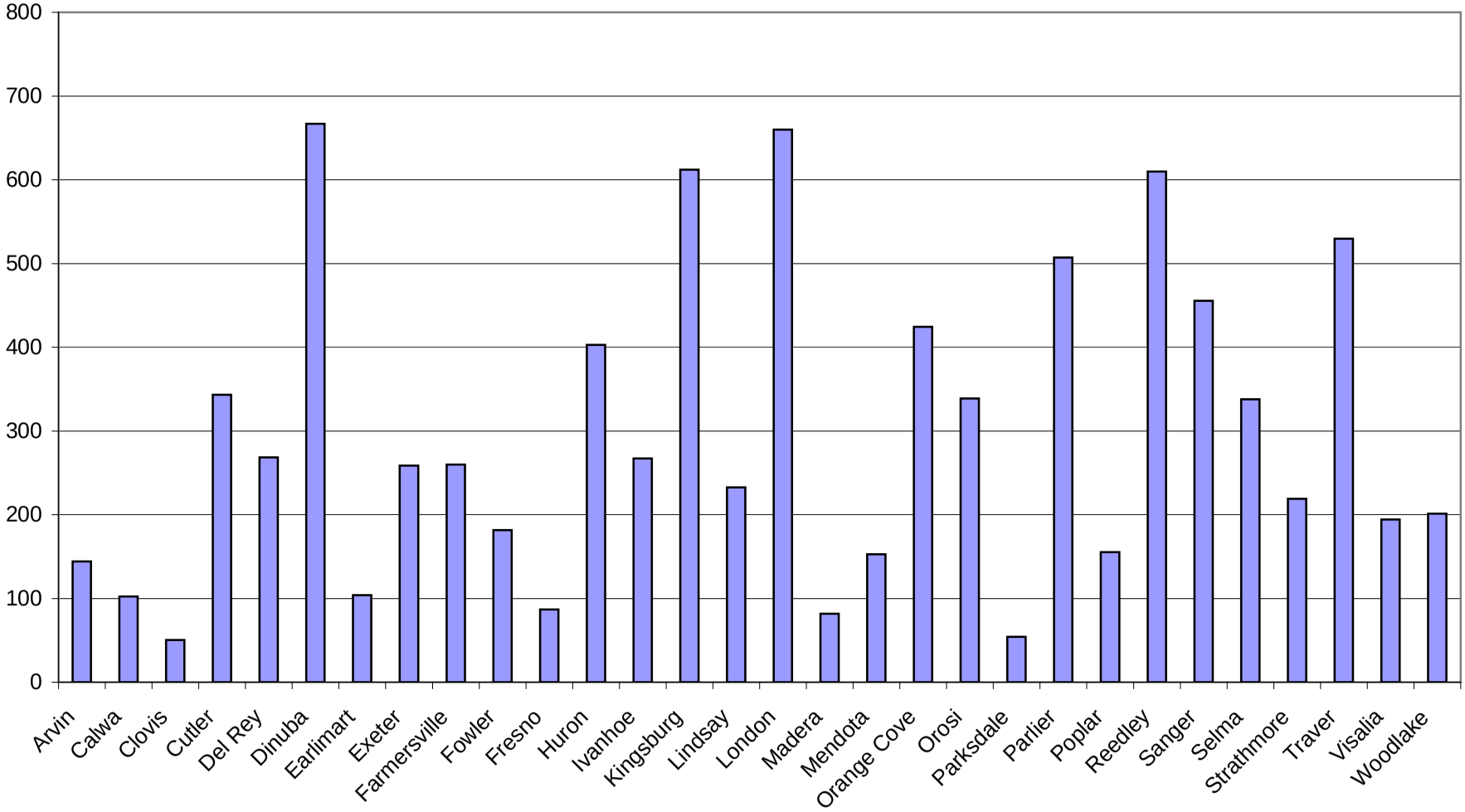
Department of Pesticide Regulation - Environmental Justice Pilot Project
Well Monitoring Density (#wells x #pesticides/mi^2) for Top 30 Rated Communities Overall



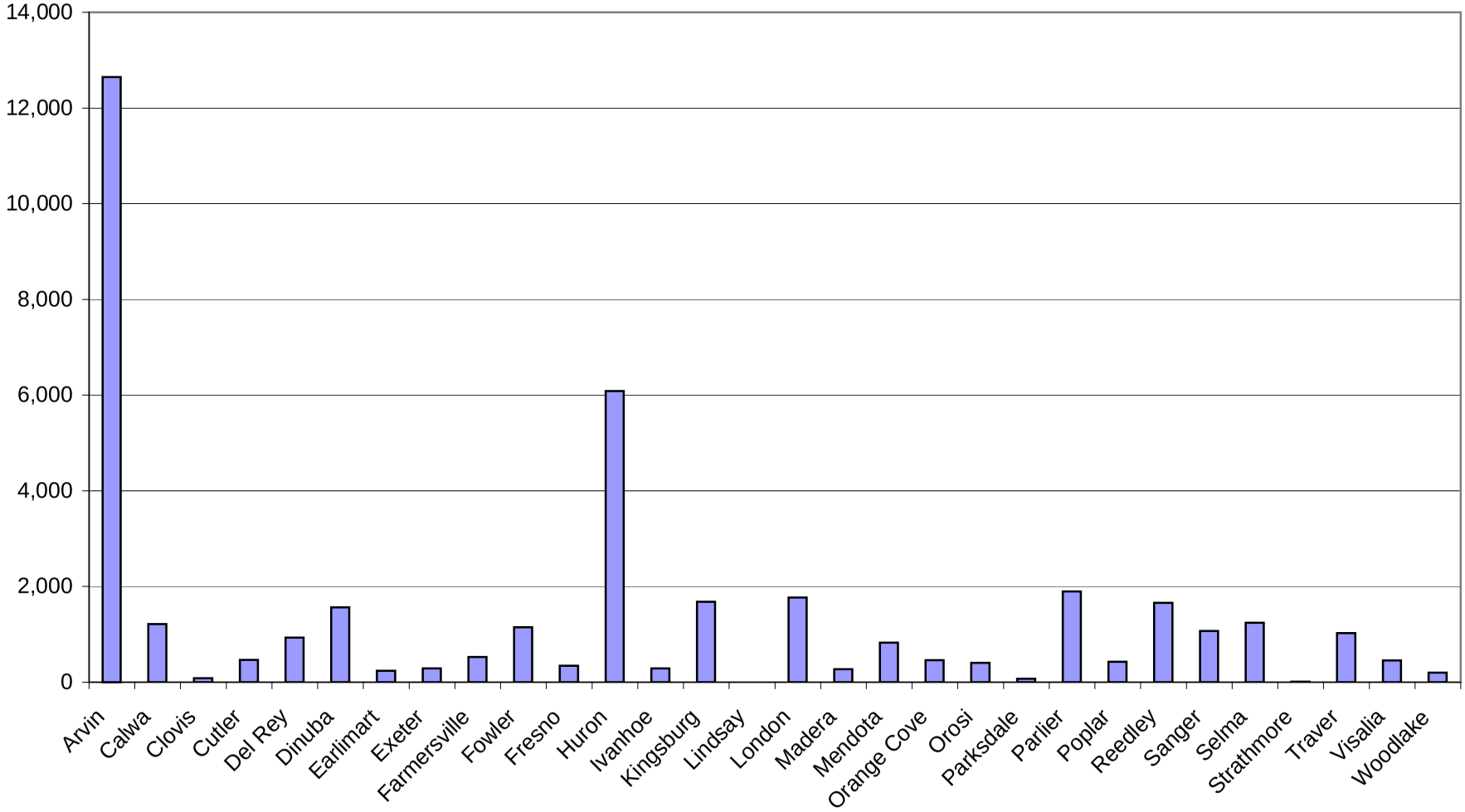
Department of Pesticide Regulation - Environmental Justice Pilot Project
Number of Criteria Air Pollutants Monitored for Top 30 Rated Communities Overall



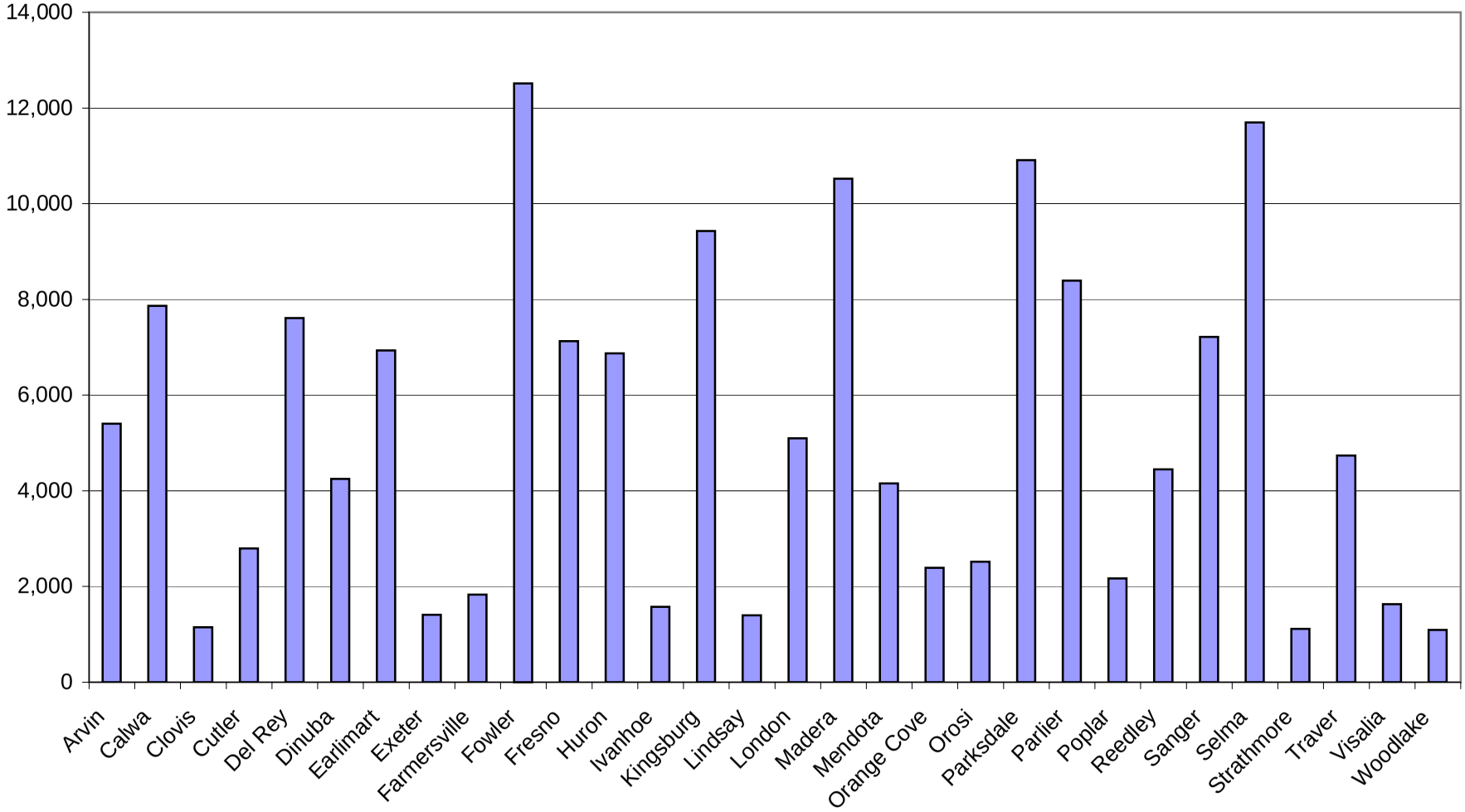
Department of Pesticide Regulation - Environmental Justice Pilot Project
Regional (within 5 mi of community) Organophosphate Use Density (lbs/mi^2)
for Top 30 Rated Communities Overall



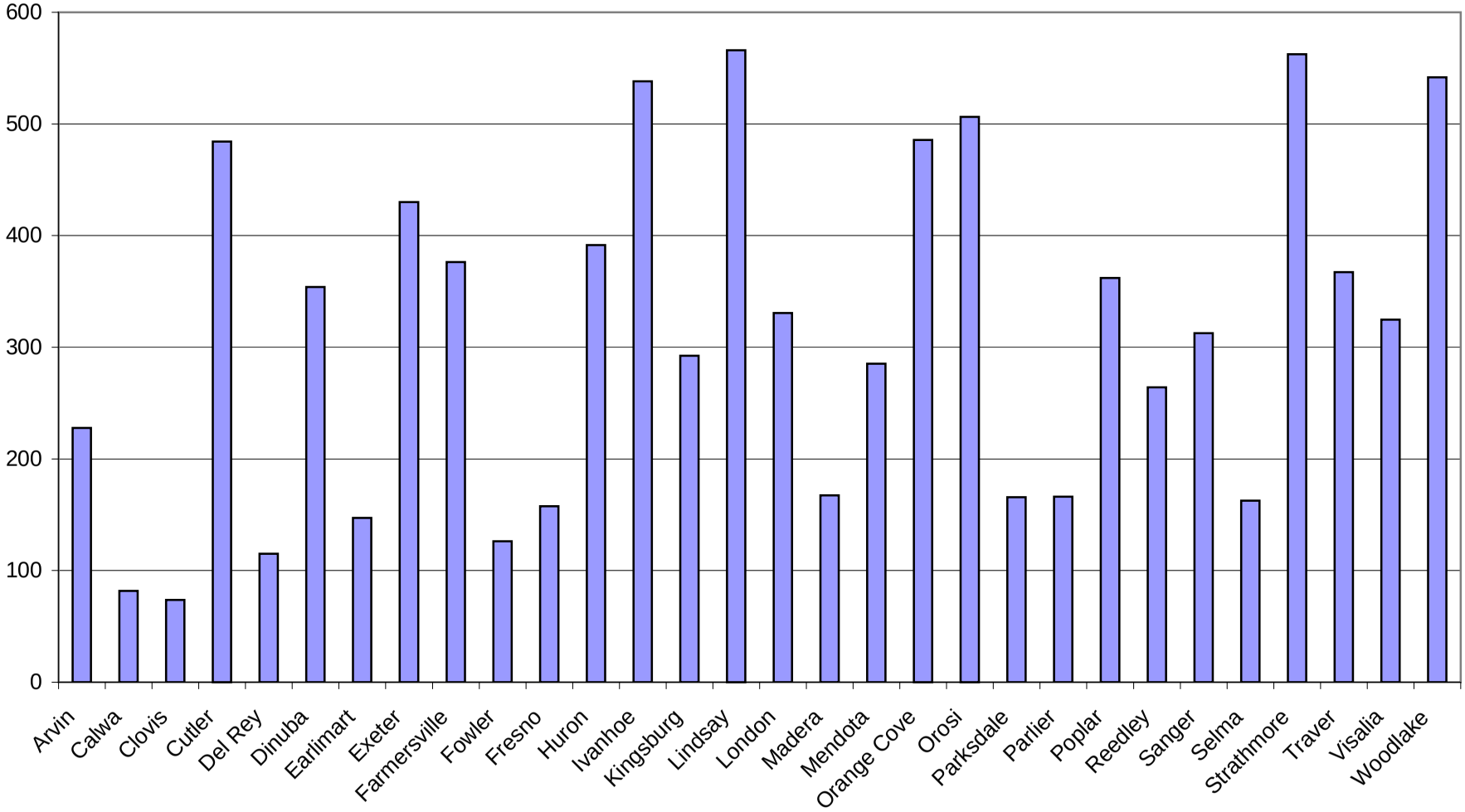
Department of Pesticide Regulation - Environmental Justice Pilot Project
Regional (within 5 mi of community) Fumigant Use Density (lbs/mi^2)
for Top 30 Rated Communities Overall



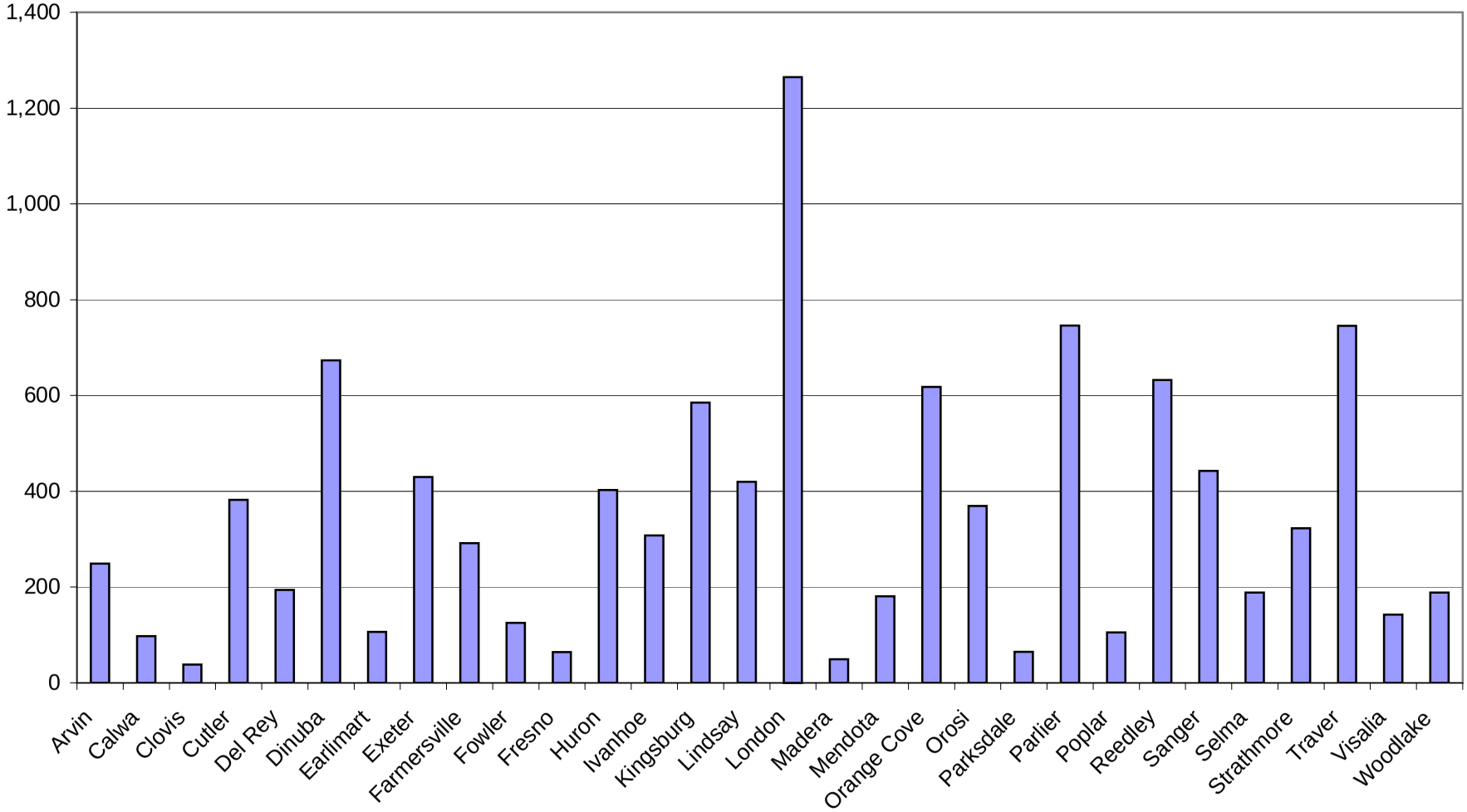
Department of Pesticide Regulation - Environmental Justice Pilot Project
Regional (within 5 mi of community) Sulfur and Copper Use Density (lbs/mi^2)
for Top 30 Rated Communities Overall



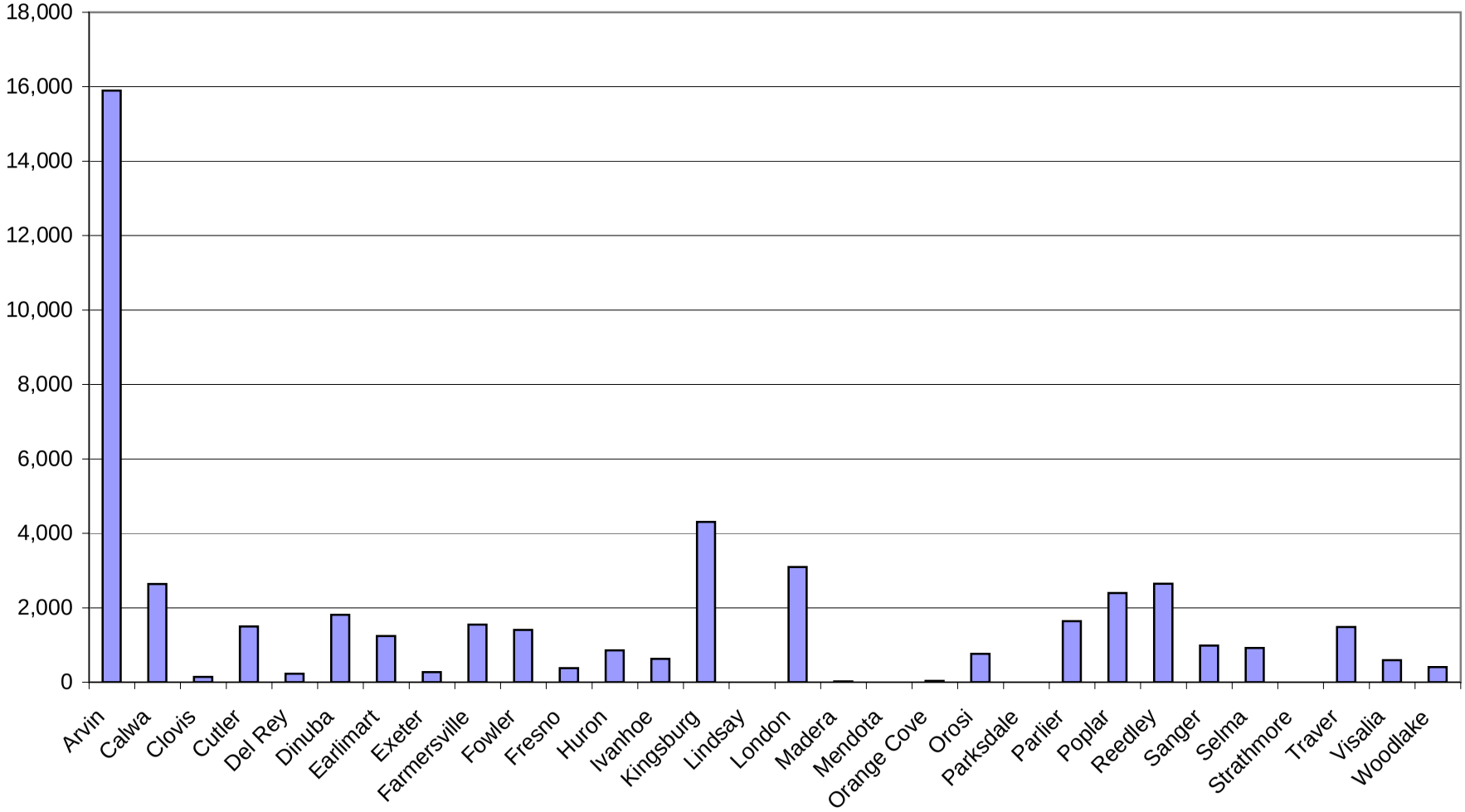
Department of Pesticide Regulation - Environmental Justice Pilot Project
Regional (within 5 mi of community) Other Pesticide Use Density (lbs/mi^2)
for Top 30 Rated Communities Overall



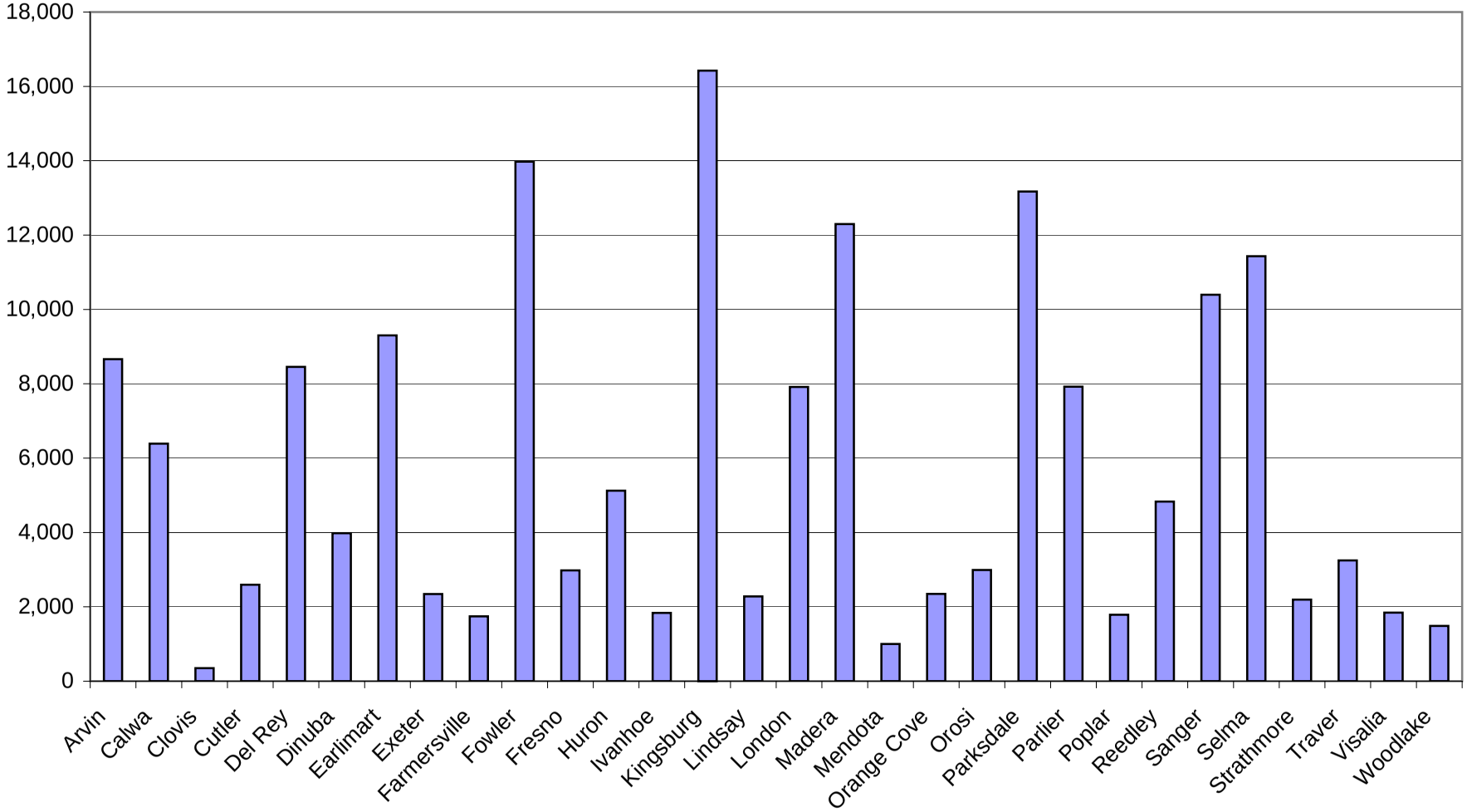
Department of Pesticide Regulation - Environmental Justice Pilot Project
Local (within 1 mi of community) Organophosphate Use Density (lbs/mi^2)
for Top 30 Rated Communties Overall



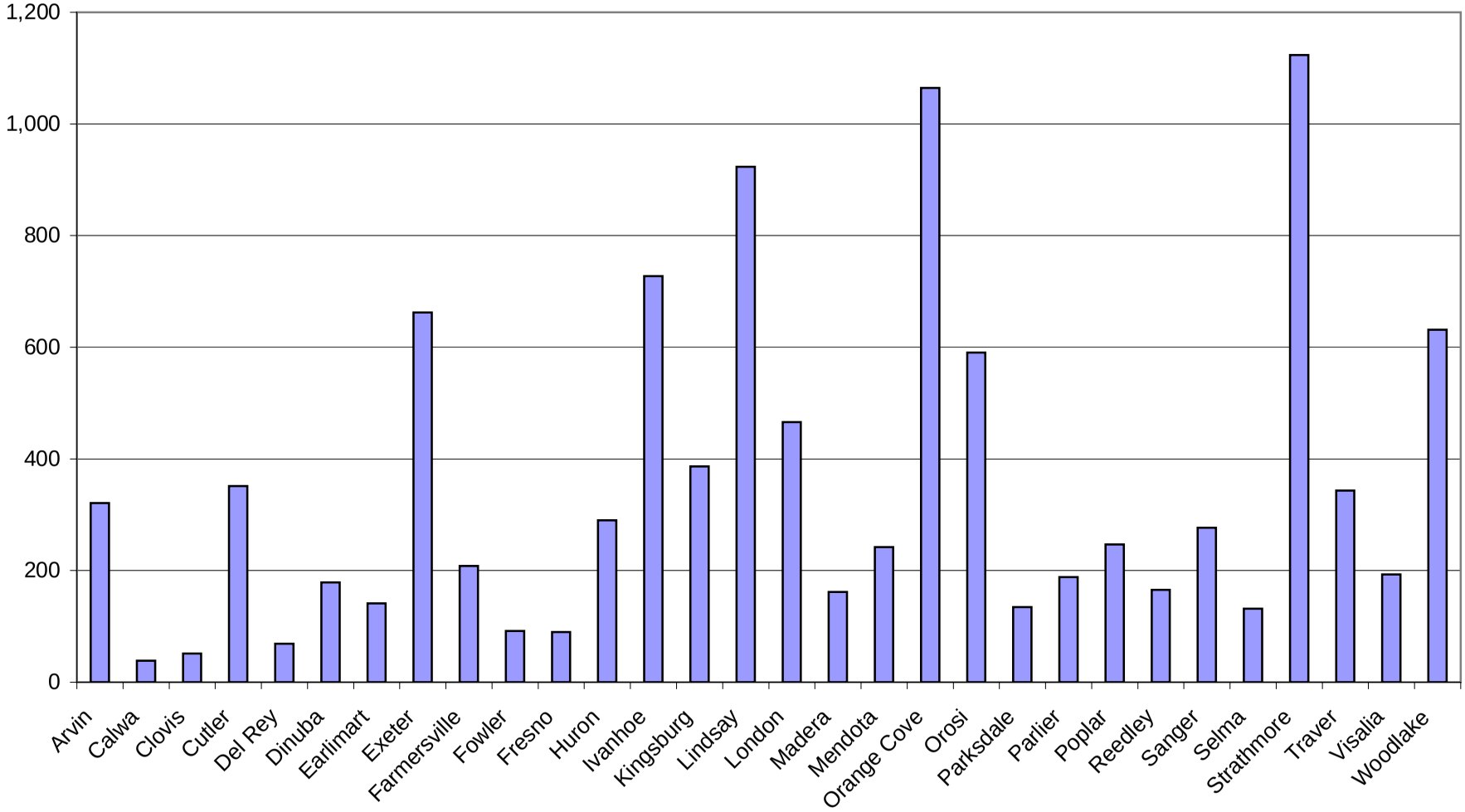
Department of Pesticide Regulation - Environmental Justice Pilot Project
Local (within 1 mi of community) Fumigant Use Density (lbs/mi^2)
for Top 30 Rated Communties Overall



Department of Pesticide Regulation - Environmental Justice Pilot Project
Local (within 1 mi of community) Sulfur and Copper Use Density (lbs/mi^2)
for Top 30 Rated Communities Overall

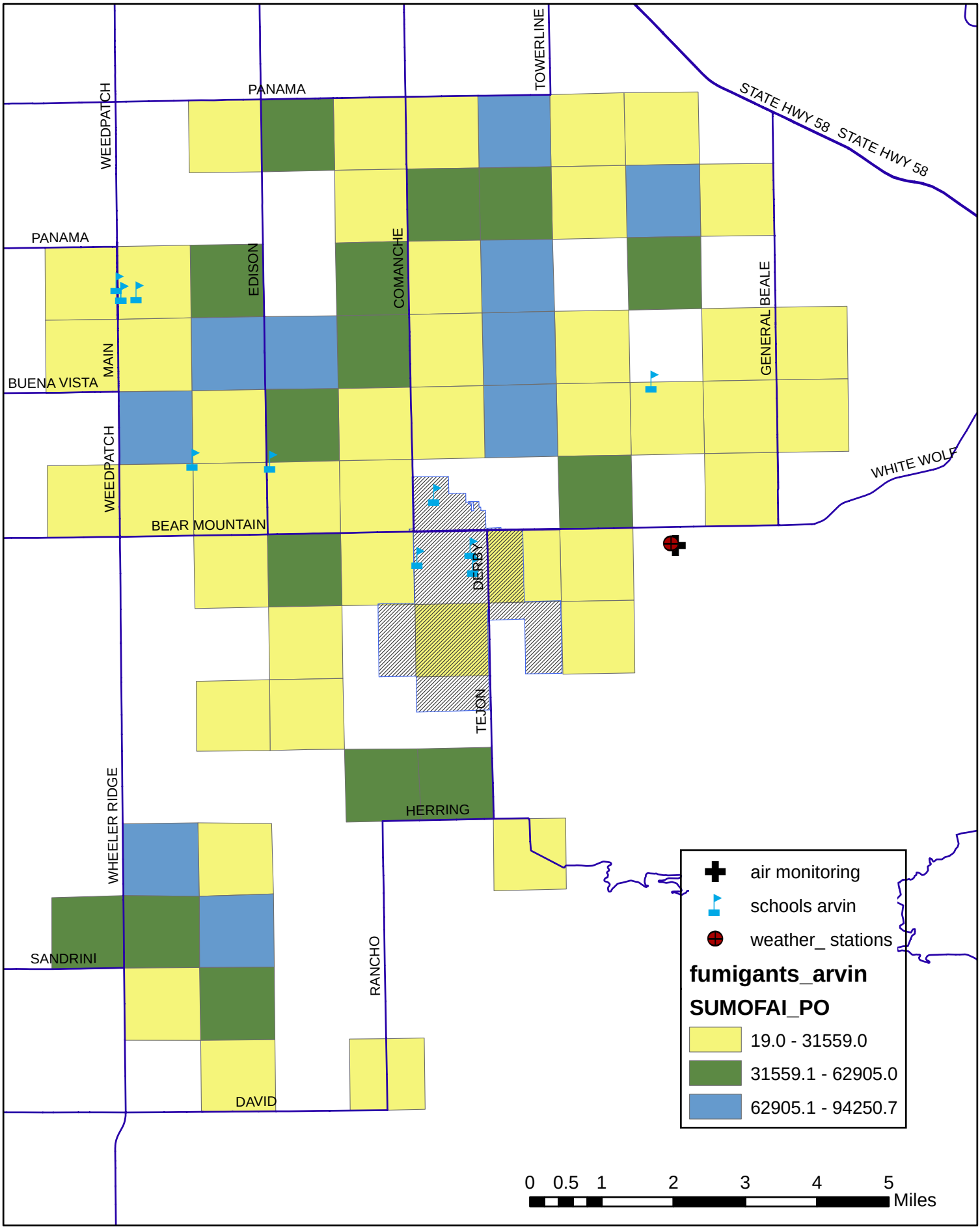


Department of Pesticide Regulation - Environmental Justice Pilot Project
Local (within 1 mi of community) Other Pesticide Use Density (lbs/mi^2)
for Top 30 Rated Communities Overall

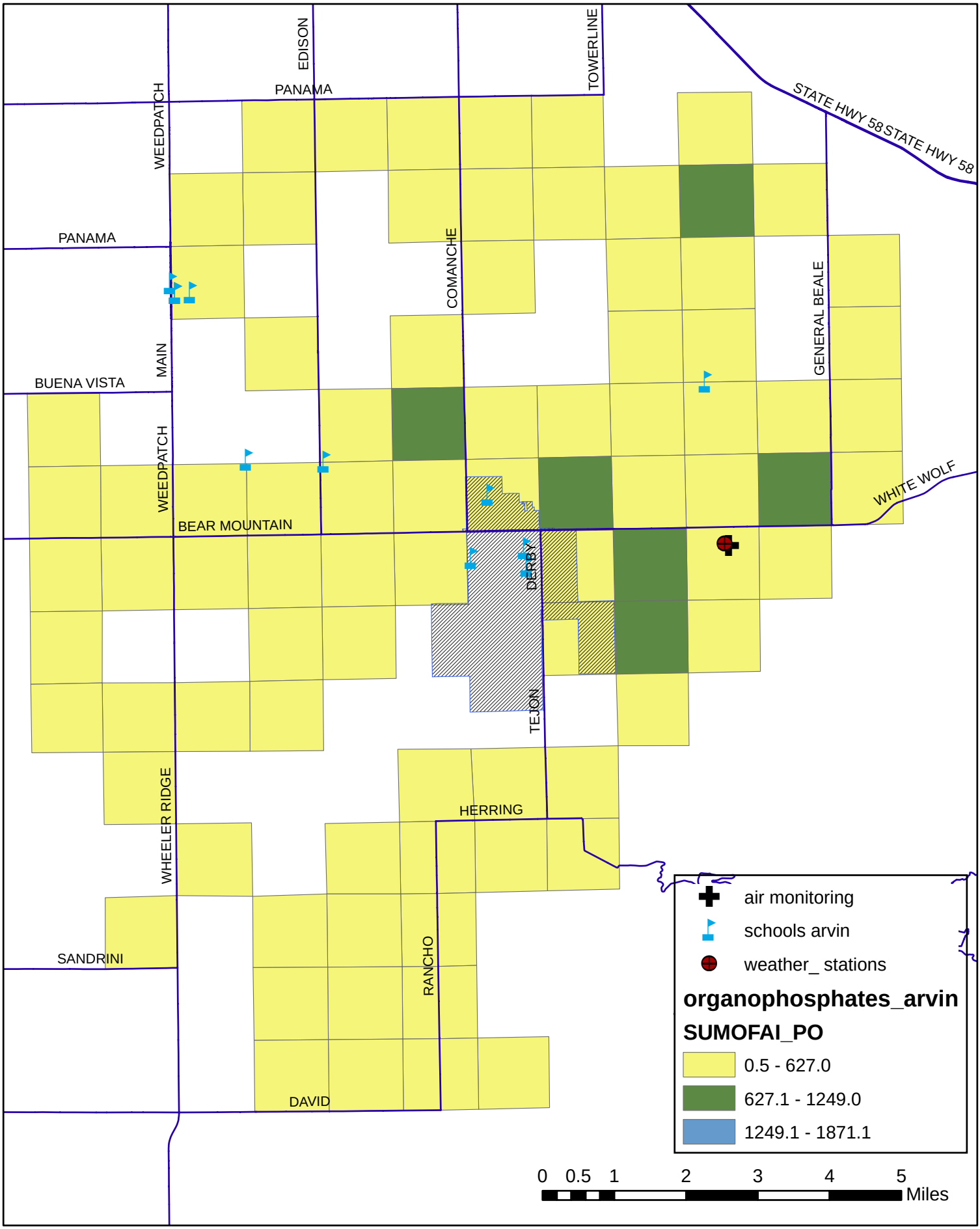


Appendix B

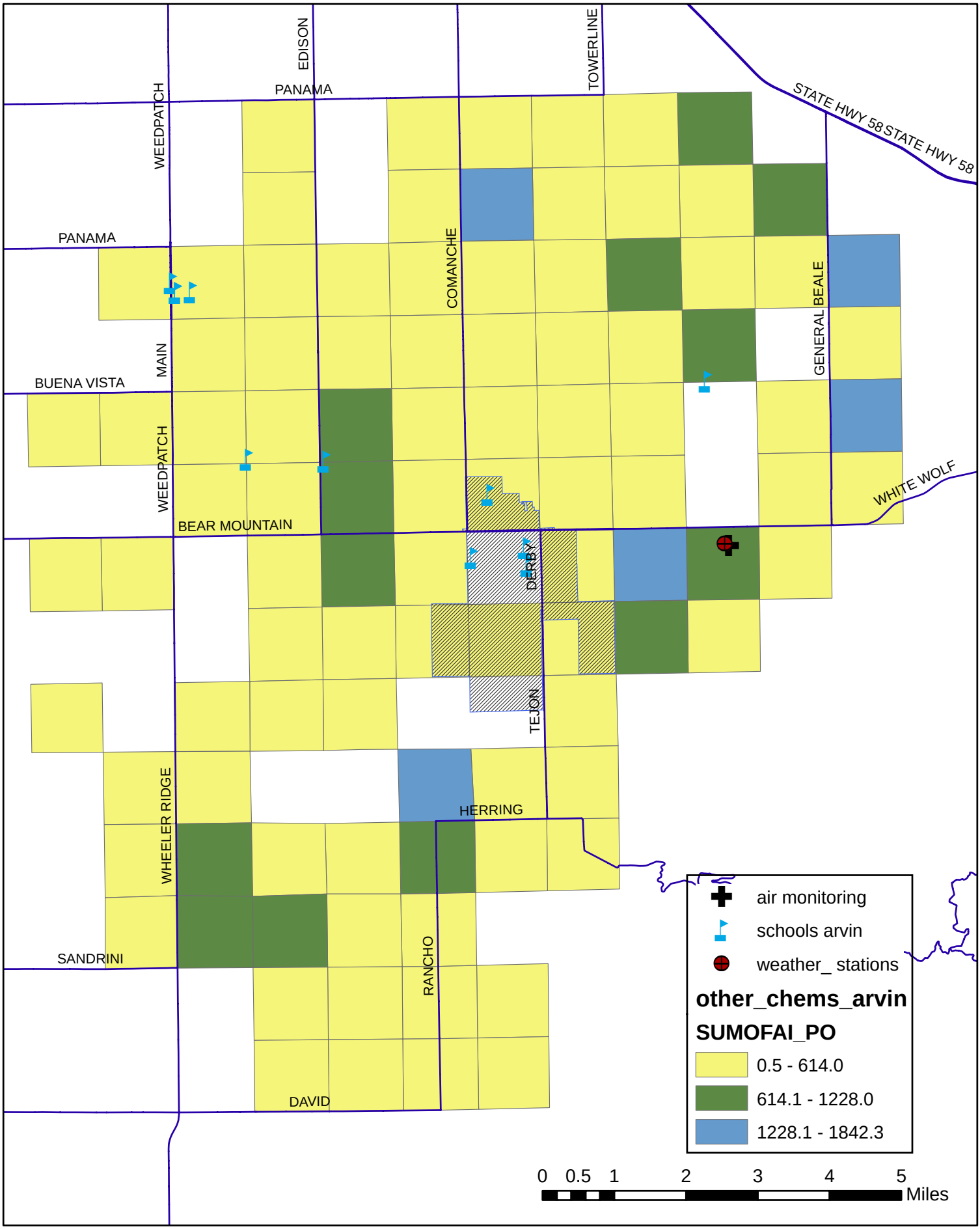
Arvin (2002 chemical use, pounds active ingredient)
Fumigant chemical use
Regional pesticide use within 5 miles of community



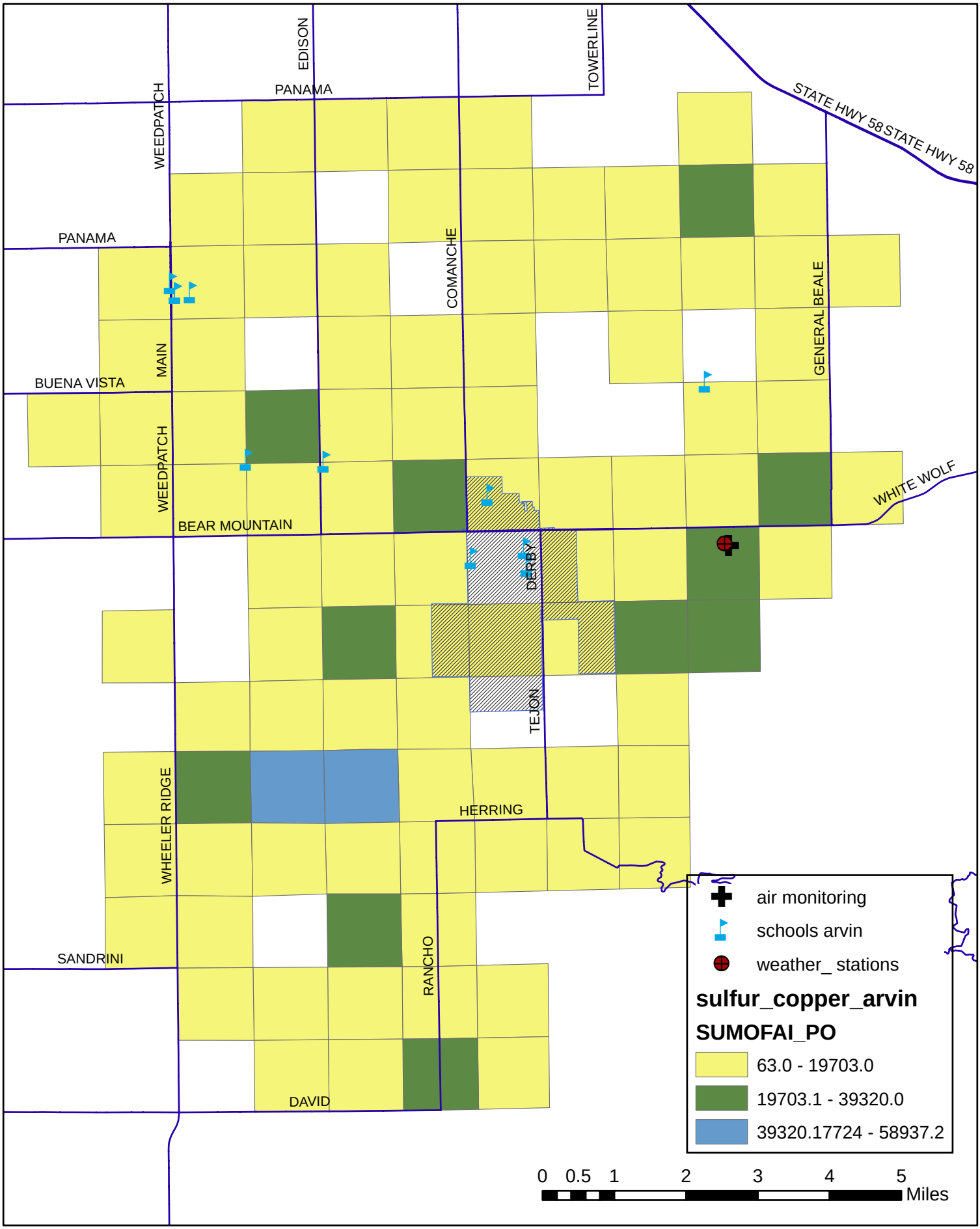
Arvin (2002 chemical use, pounds active ingredient)
Other chemical use
Regional pesticide use within 5 miles of community



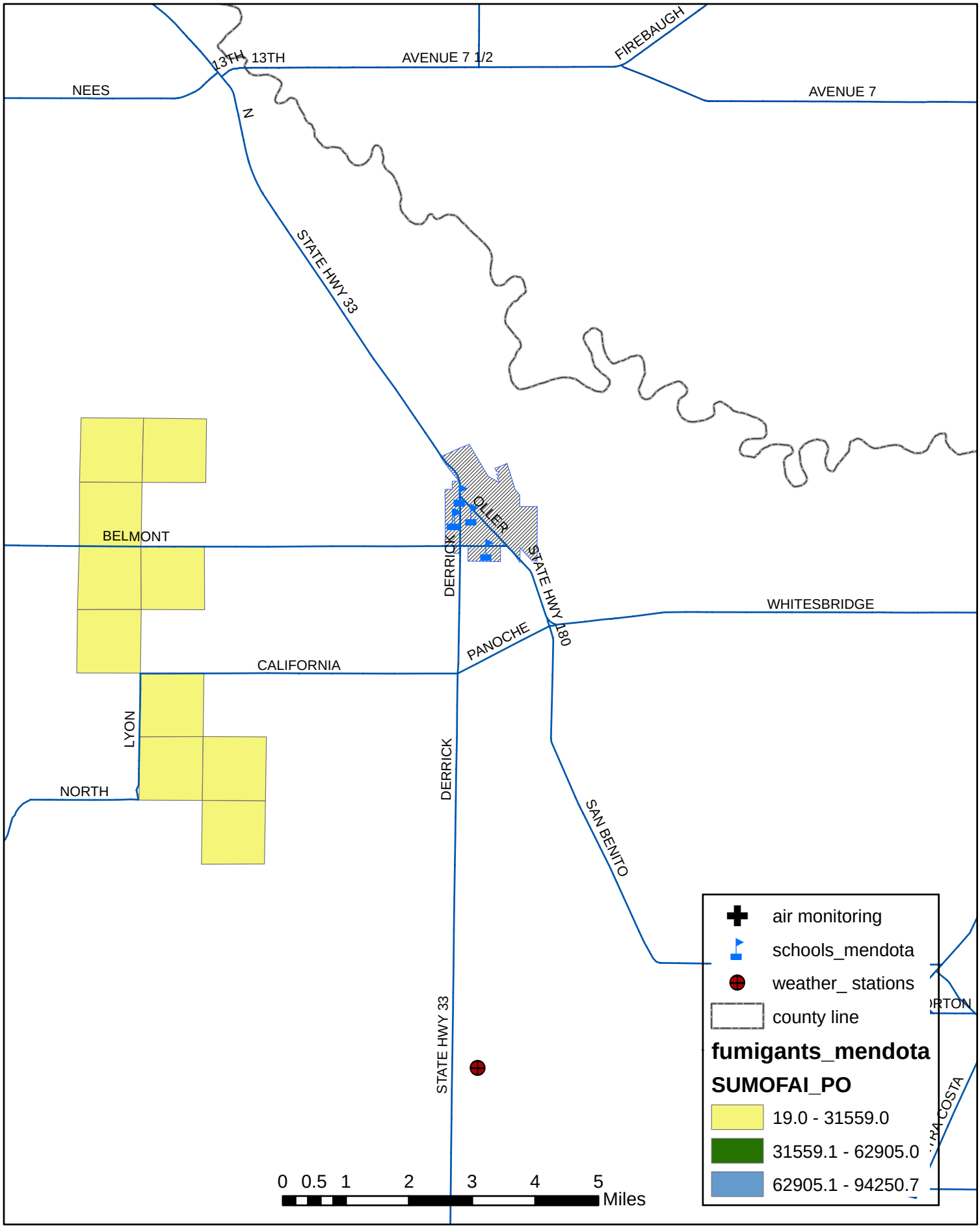
Arvin (2002 chemical use, pounds active ingredient)
Other chemical use
Regional pesticide use within 5 miles of community



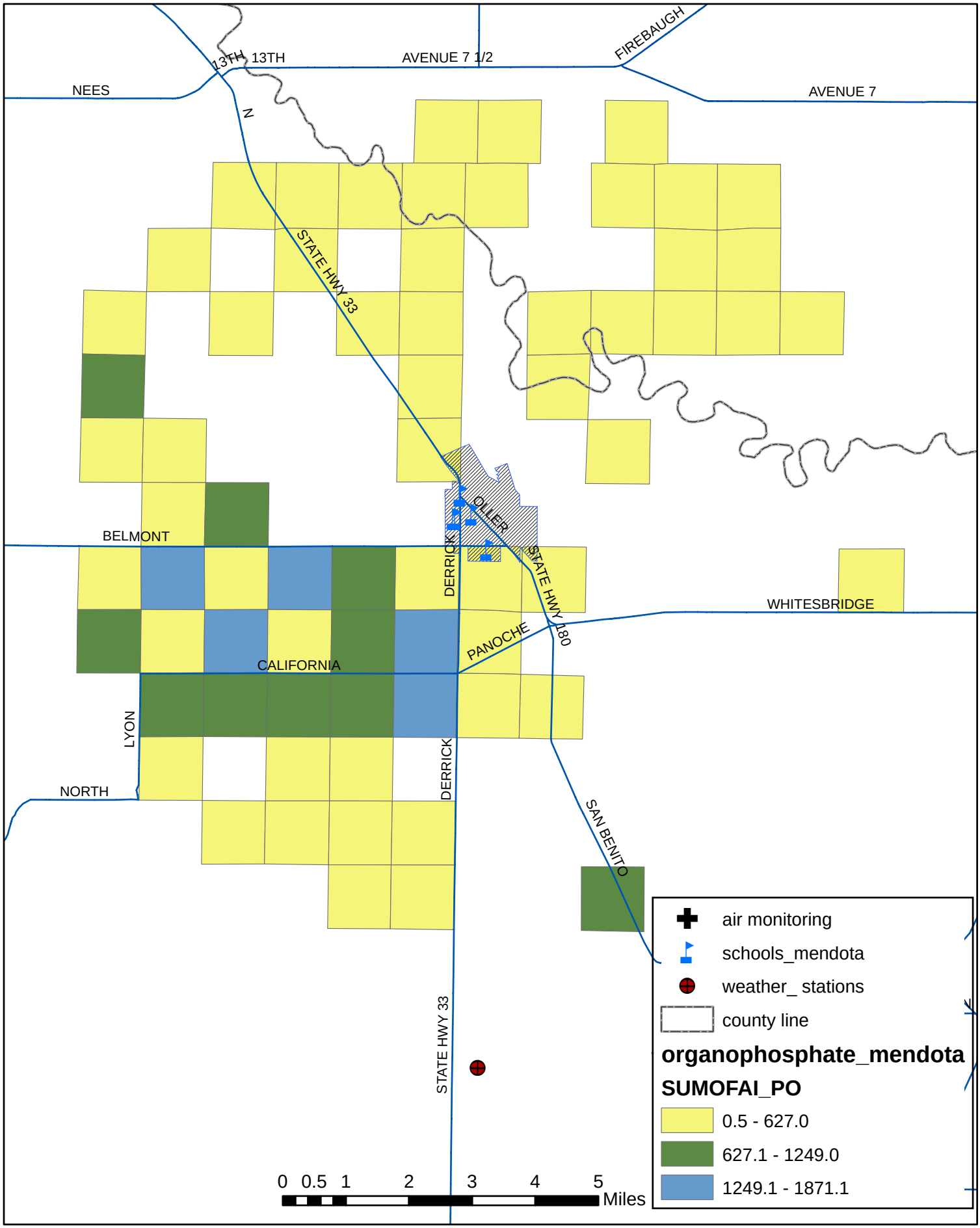
Arvin (2002 chemical use, pounds active ingredient)
Sulfur and copper chemical use
Regional pesticide use within 5 miles of community



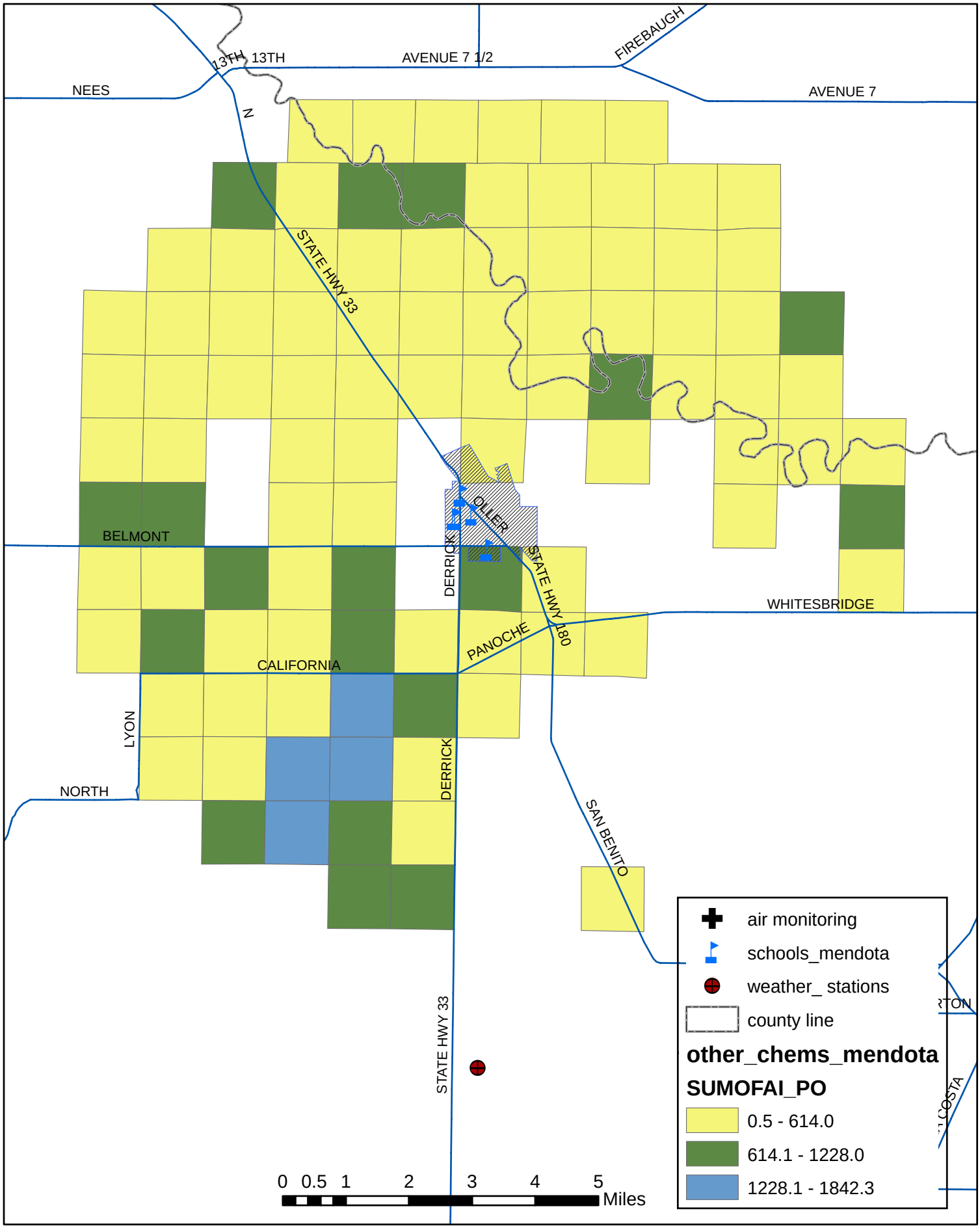
Mendota (2002 chemical use, pounds active ingredient)
Fumigant chemical use
Regional pesticide use within 5 miles of community



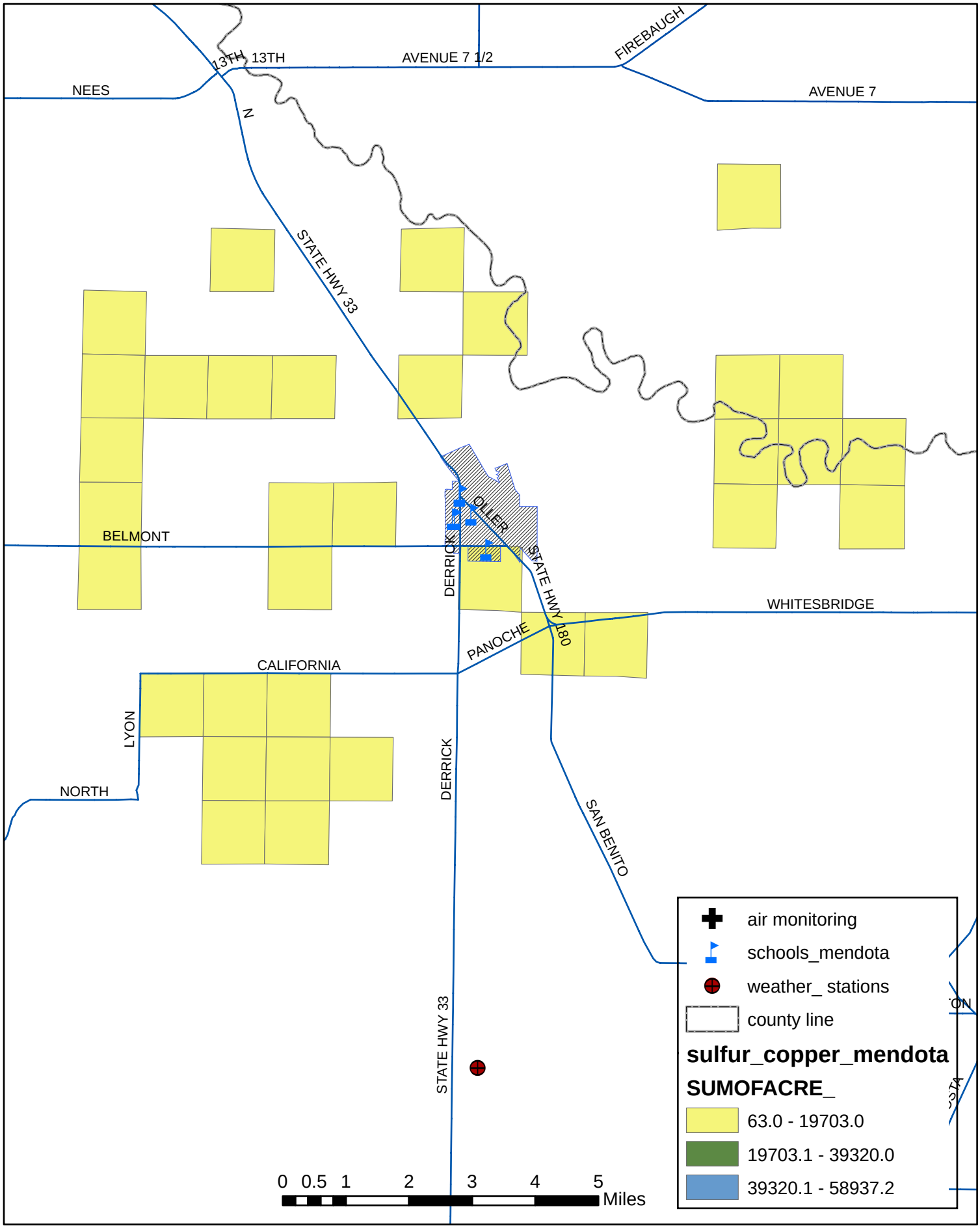
Mendota (2002 chemical use, pounds active ingredient)
OP chemical use
Regional pesticide use within 5 miles of community



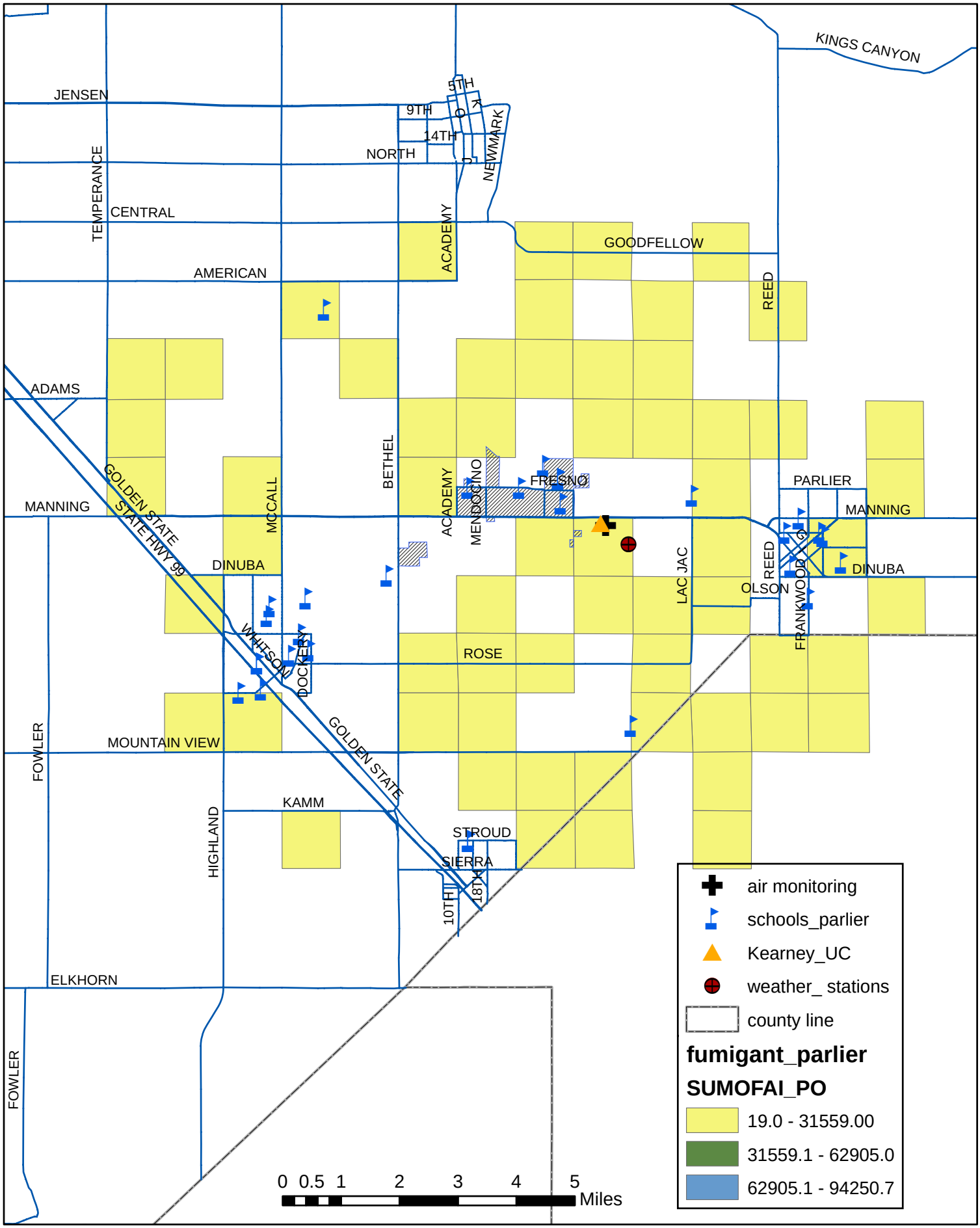
Mendota (2002 chemical use, pounds active ingredient)
Other chemical use
Regional pesticide use within 5 miles of community



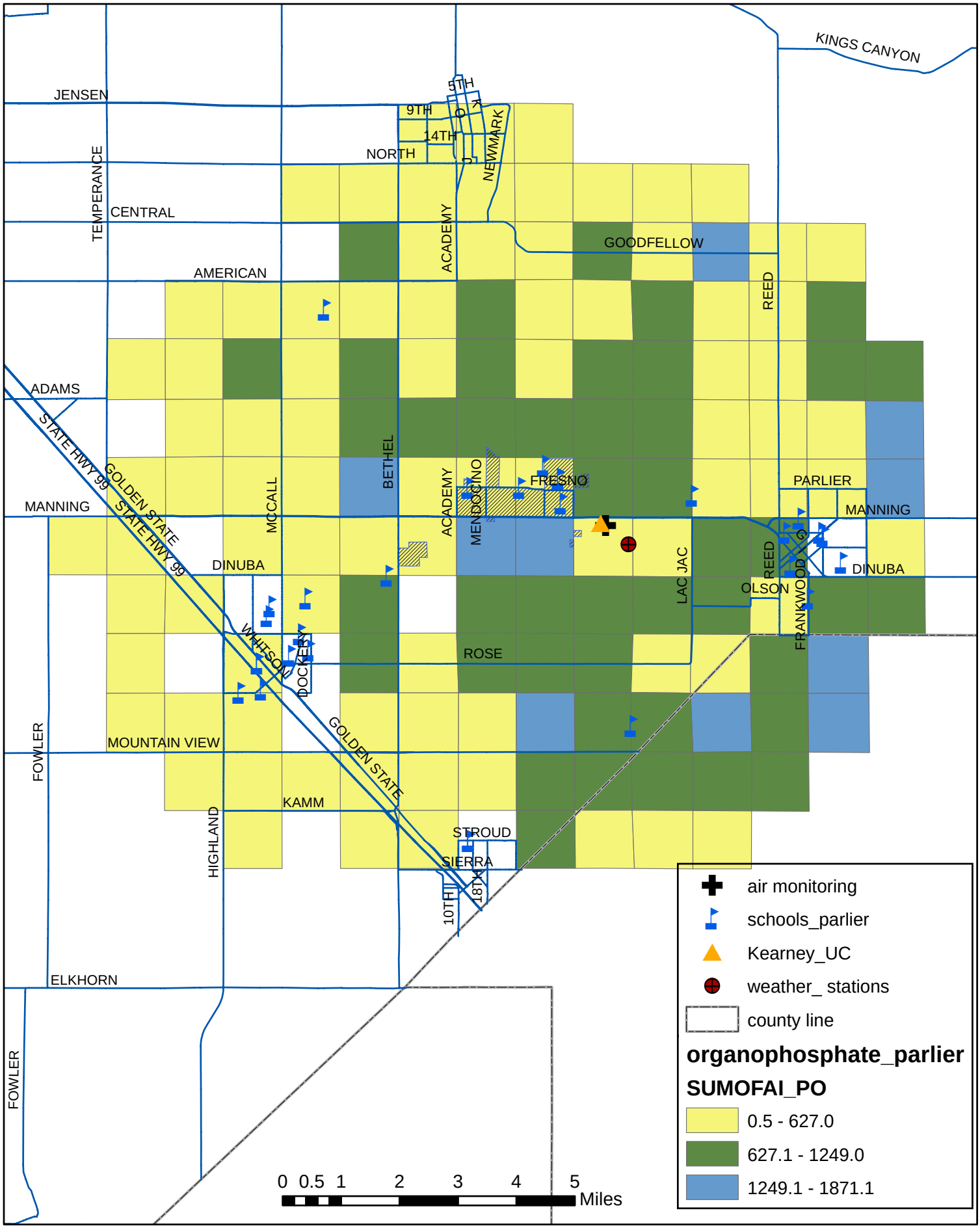
Mendota (2002 chemical use, pounds active ingredient)
Sulfur and copper chemical use
Regional pesticide use within 5 miles of community



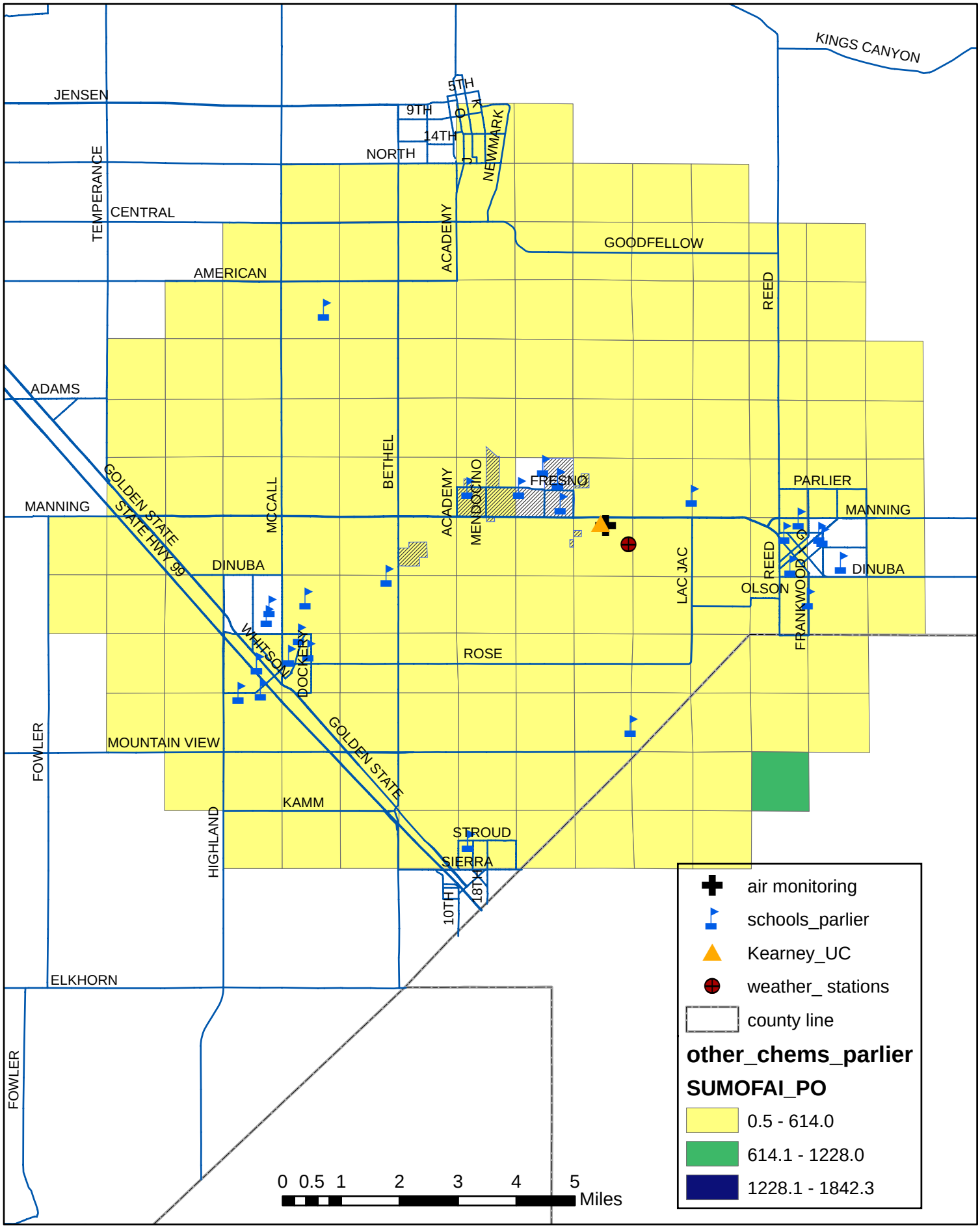
Parlier (2002 chemical use, pounds active ingredient)
Fumigant chemical use
Regional pesticide use within 5 miles of community



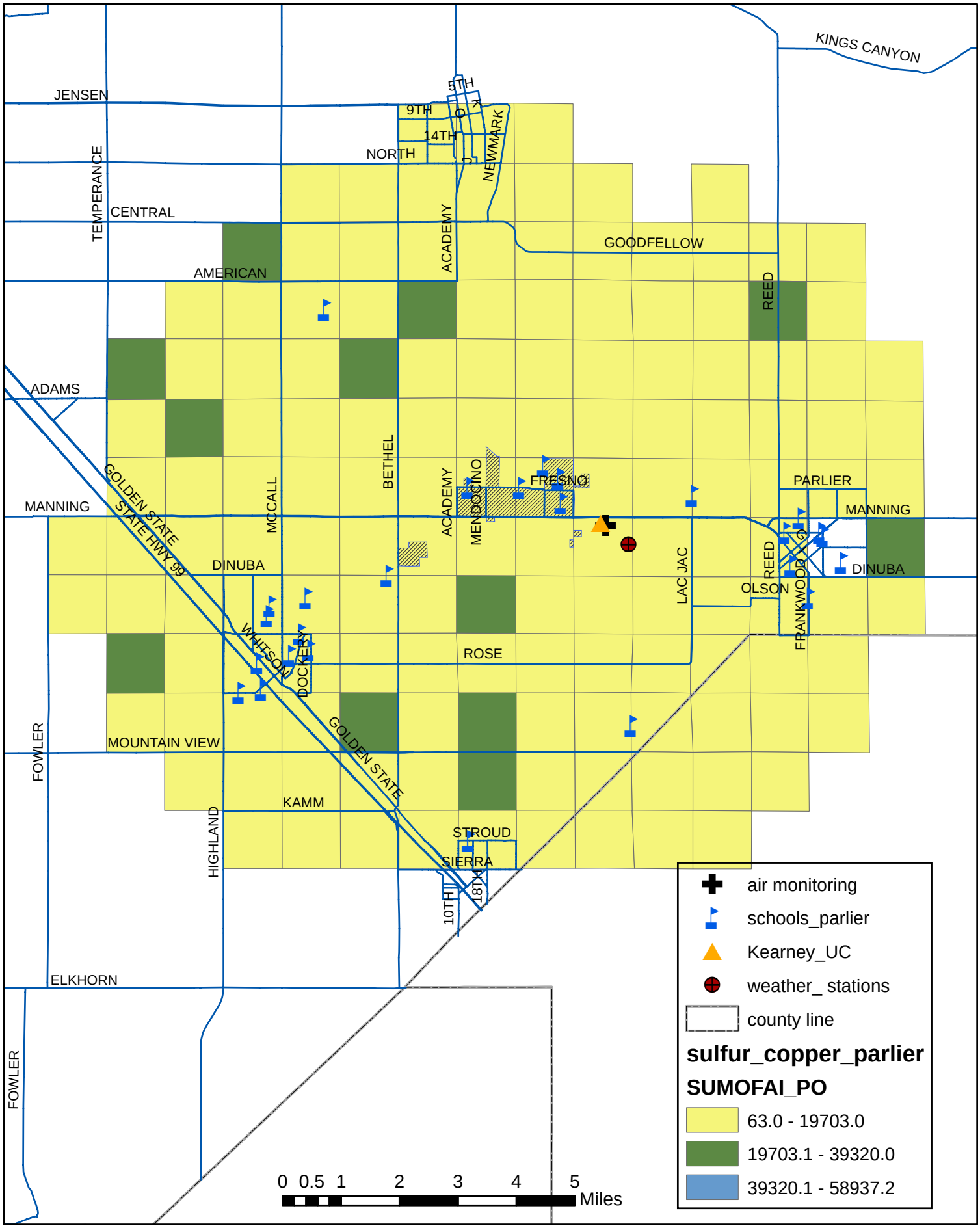
Parlier (2002 chemical use, pounds active ingredient)
OP chemical use
Regional pesticide use within 5 miles of community



Parlier (2002 chemical use, pounds active ingredient)
Other chemical use
Regional pesticide use within 5 miles of community



Parlier (2002 chemical use, pounds active ingredient)
Sulfur and copper chemical use
Regional pesticide use within 5 miles of community



APPENDIX C

DPR Response to First Set of Public Comments

DPR incorporated many of the suggestions from commenters, particularly those that assisted in establishing criteria to select pesticides and the community. However, some comments conflicted with one another. For example, most people suggested that DPR monitor schools adjacent to agricultural areas. However, at least one person suggested that DPR specifically avoid monitoring at schools.

Comments received on pesticide selection:
DPR incorporated the following comments in its pesticide selection criteria:

- Monitor for MITC and other fumigants
- Monitor for organophosphates
- Select pesticides that can be monitored with a single method
- Monitor for pesticides with high vapor pressure
- Monitor for pesticides with high use
- Monitor for pesticides with high toxicity
- Inventory previous studies to avoid duplication

DPR did not incorporate the following comments in its pesticide selection criteria:

- Monitor for defoliants.
  Response: Methods are not available for paraquat and sodium chlorate; S,S,S-tributylphosphorotrithioate (DEF) will likely be monitored.
- Monitor for methomyl, propargite, captan, chlorothalonil, iprodione, sulfur.
  Response: DPR will attempt, but these may not be included in the monitoring if the Lompoc method cannot be adapted to include them.
- Monitor pesticides with longer half-lives.
  Response: Peak emissions for most pesticides occur within the first few hours or days of application. Very few pesticides degrade fast enough to affect air concentrations. For most pesticides, a long or short half-life likely has little effect on exposure through the air.
- Monitor Proposition 65 pesticides.
  Response: Some included, but not a criterion for selection.
- Do not monitor Proposition 65 pesticides, category 1 and 2 pesticides, or restricted materials.
  Response: Some are not included, but not a criterion for selection.

- Monitor urban pesticides.
  Response: some are included, but detailed use data is not available to identify the high urban-use pesticides.
- Analyze samples already collected by ARB, rather than collect additional samples.
  Response: The ARB samples are incompatible with the methods used to analyze for the target pesticides.

Comments received on community selection:
DPR incorporated the following comments in its community selection criteria:

- Select a community with low income
- Select a community that had pesticide drift incidents
- Select a community of color
- Select a community with schools in the middle or adjacent to agricultural areas
- Select a community with monitoring sites on the periphery of the community
- Select a community where the adjacent area as well as general area have high use
- Consider exposure pathways other than air
- Select a community with diverse crops
- Select a community with actual or perceived health effects
- Collaborate with organizations planning complementary studies
- Select a single community
- Monitor several sites within a single community
- Select a community with high air stability and low wind speed
- Choose a community with a high percentage of children
- Use three years of pesticide use report data – one year of data examined for all community candidates; three years of data examined for leading candidates

One or more commenters suggested the following specific communities:

- Arvin (Kern County)
- Caruthers (Fresno County)
- Earlimart (Tulare County)
- Grayson (Stanislaus County)
- Huron (Fresno County)
- Lamont (Kern County)
- Lebec (Kern County)
- "Midway" neighborhood (Madera County)
- Poplar (Tulare County)
- Ventura County communities

Arvin is a highly rated community using DPR's proposed criteria, along with nearby Lamont. Earlimart and Huron are highly rated communities if availability of cumulative impact data is not a factor. Poplar has moderate to high ratings in all categories, but other communities have higher ratings. Caruthers has high pesticide use, but other communities have higher use. Caruthers has low ratings for environmental justice factors and availability of cumulative impact data. Grayson has low to moderate ratings in all categories.

Several of these suggested communities were not evaluated in depth. The "Midway" neighborhood is not a community included in the Census, so the population data for this area is uncertain. The nearby community of Biola is not a leading candidate. In addition, "Midway" does not have schools or other preferred monitoring sites, and may not have any locations that meet the minimum siting criteria. Lebec and Ventura County were not considered because they are not within the San Joaquin Valley.

DPR did not incorporate the following comments in its community selection criteria:

- Select a community to establish profile of air concentrations by crop.
  Response: Incompatible with current study design. Requires monitoring at fields, rather than communities. In addition, a primary goal for this project is to determine the cumulative exposure for as many pesticides as possible. Focusing on a single crop will decrease the number of pesticides that are included in the project.
- Do not monitor schools.
  Response: Incompatible with primary goal of focusing on children's health. Schools are routinely monitored for DPR's toxic air contaminant program.
- Monitor "control" community. Select typical community (for example, average number of children and wind speed).
  Response: Putting aside the question of whether it is technically or scientifically feasible to identify a valid "control" community, DPR does not have the resources to adequately monitor more than one community.
- Select a community with dairies nearby.
  Response: Dairies use very few pesticides. DPR lacks expertise and equipment to monitor non-pesticide emissions from dairies.
- Monitor several communities.
  Response: DPR lacks the resources to adequately monitor more than one community.
- Literacy rates should be a factor in community selection.
  Response: DPR used four environmental justice criteria for its community selection. Three of these (child population, non-white population, and income) target the populations of interest for this project, as well as all other Cal/EPA environmental justice efforts. The fourth (drift illnesses) helps to select the populations of interest for pesticide exposure. While literacy is an important issue, it is not a primary goal of Cal/EPA's or DPR's environmental justice efforts. Including this or other secondary factors will dilute the effect of children, race, and income in selecting the community.
- Select community with high infant mortality.
  Response: DPR will attempt to collaborate with other organizations to identify relationships between air concentrations and health outcomes. However, DPR is attempting to select a community with relatively high pesticide exposure, using pesticide characteristics and use patterns as surrogates. Using infant mortality or other health outcomes to select the community will dilute the effect of the factors used to identify communities with relatively high pesticide exposure.

Other Comments:

DPR will address the following comments later in the planning process or during implementation:

- Monitoring should support modeling efforts
- Develop limits of quantitation
- Reevaluate reference exposure levels
- Clarify health standards
- Do not release monitoring schedule
- Time monitoring with pesticide applications
- Some sampling should capture pesticides on dust or particulates
- Sampling should occur during weekends as well as weekdays

- Sampling should be conducted when high air stability overlaps with high use
- Use peer reviewed methodologies
- Do not use default values or data points when there is not available data
- Controls must be used to give a basis of comparison that has statistical significance
- Which standards will be used to determine if levels are cause for human health concerns, are these to be USEPA or CADPR standards?
- Clarify that this presents scientific limitations and that drawing conclusions from a study that had no replication or controls (an urban community with no agricultural pesticide exposure) is not the objective.
- Include analysis of demographic data and health indicators

DPR does not have the technical expertise or equipment to incorporate the following suggestions:

- Monitor for ozone, particulates, and other criteria air pollutants
- Monitor for other toxics
- Consider monitoring for inerts
- Monitor for bacteria, mold, and other biological agents

In addition, DPR received these comments:

- Cancel project due to budget considerations.
  Response: DPR had planned to conduct a similar monitoring project this year, without the environmental justice emphasis. This project involves a simple redirection of monitoring resources. None of DPR's other programs, such as enforcement and registration, are affected by this project.
- Increase enforcement activities instead of monitoring.
  Response: DPR and county agricultural commissioners (CACs) administer a comprehensive enforcement program that includes measures to control public exposure to pesticides, and if necessary, investigate drift episodes. (See "Pesticide Use Enforcement Program Planning and Evaluation Guidance," a policy guidance letter to CACs, for details on enforcement priorities. The letter is online at www.cdpr.ca.gov/docs/enfcmpli/penfltrs/penf2004/2004023.htm.) DPR staff who will conduct this pilot project are scientists, not regulatory specialists. The monitoring staff do not have regulatory expertise and cannot be redirected to enforcement activities.
- Conduct outreach so people know how to report drift incidents.
  Response: DPR is developing and will distribute a "Community Guide to Pesticide Regulation" so people know how to report drift and other instances of illegal pesticide use. The guide will be translated into Spanish.

DPR Response to the Second Set of Public Comments

DPR proposed specific objectives, pesticides, and a community for monitoring in the previous draft of this document, dated January 14, 2005. Most of the comments on the draft document either agreed or disagreed with the proposed selection of Parlier for monitoring.

Comments disagreeing with the proposed selection of Parlier

- Before DPR decides on a community they need to take a close look at 2003 use of the pesticides they intend to monitor for around the community. Several other runner-up communities such as Huron and Earlimart should be considered in this analysis.

  Response: DPR did not get a chance to make a detailed evaluation of the 2003 pesticide use data before making its recommendation. However, DPR staff substituted the Parlier 2003 use data for 2002 and recalculated the ratings. Parlier had a lower rating using the 2003 data, but it still had the highest overall rating of all communities. DPR conducted a detailed evaluation Huron and Earlimart because they made the first, but not final cut. These communities rated highly for both EJ factors and pesticide use. However, they rated zero for availability of cumulative impact data. Neither had well monitoring data or critieria air pollutant monitoring. Assessing cumulative impacts is a primary goal of this and the other pilot projects, and DPR may not be to do this if Huron or Earlimart is selected.

- DPR's pesticide use rating system does not distinguish between somewhat high use and very high use of a pesticide group such as the fumigants. That is why Parlier and Arvin have the same rating for fumigant use even though use is much higher around Arvin. A more precise rating scale should be used in making the final determination of the community to conduct monitoring in.

  Response: The commenter is correct that DPR's rating system does not fully reflect the very high use of fumigants around Arvin. This was by design. If the ratings were proportional to use as suggested, a single pesticide could dominate the ratings, as is the case for Arvin. Metam use in the Arvin area is higher than all other pesticides combined, and Arvin would be highly rated due to use of this single pesticide. DPR is interested in monitoring a community with high use of multiple pesticides, rather than very high use of a single pesticide. Monitoring very high use of a single pesticide is already captured by the toxic air contaminant program. Metam and other fumigants were monitored in Arvin during 2001 for the toxic air contaminant program.

Comments on other monitoring

- DPR's analysis of water monitoring refers only to DPR's Well Inventory Database. Availability of water monitoring data that local water companies and agencies submit to DHS and county health departments should be investigated for those communities that have high environmental justice and pesticide use ratings.

  Response: Government agencies are legally required to submit all pesticide well monitoring data to DPR. DPR has all of the pesticide well monitoring data collected by DHS and county health departments, and DPR accounted for this data in its ratings.

- The project looks at only one source of airborne exposure, pesticides, without consideration of the numerous other airborne sources such as dioxin/PCBs, heavy metals, radon, asbestos, pollen, molds, etc.

  Response: DPR will evaluate other air contaminants. Parlier was selected in part because of the availability of monitoring data for criteria air pollutants. In addition, with ARB's assistance, DPR will collect samples for volatile organic compounds and metals.

- The Department should inventory existing scientific peer reviewed studies to avoid any duplications. Rather than initiate another monitoring program, the Department's limited resources could be best utilized by analyzing existing data already available.

  Response: DPR has inventoried other similar studies. None provide the monitoring or evaluation that DPR plans to conduct for this project.

Comments on the Local Advisory Group

- According to DPR's implementation schedule, the Local Advisory Group (LAG) will not be formed until after the project objectives are finalized. In order to benefit from local community involved and allow community buy-into the project, the LAG should be formed in time to influence the final objectives of the project.

  Response: DPR agrees and will consult with the LAG on project objectives.

- In order for the local advisory group to accurately meet all of the objectives of reflecting the diversity of view points in the community, showing a balance of representation of Parlier, and bringing the community together, it's very important that production agriculture is represented.

  Response: DPR agrees and recruited growers and other people that are not represented by Parlier's existing Coordinating Responsibility Authority Committee.

Other comments

- The pilot project also omits any plans to collect health data from the community either in the form of a health survey or bio-monitoring. Instead, the project objectives are to compare monitoring data with pre-set Reference Exposure Levels (REL). This wastes an opportunity to determine the protectiveness of the RELs themselves. The pilot project needs to examine the health of the community currently to determine whether or not the community bears a disproportionate impact from pesticide exposure.

  Response: DPR selected Parlier in part because of the collaborative opportunities it offers. DPR will collaborate with UC San Francisco's Valley Air Pollution Health Effects Research Institute on their study of asthma and air contaminants. DPR will also collaborate with the state's Environmental Health Tracking Program to evaluate possible correlations between health outcomes and pesticide air concentrations.

- DPR's analysis puts a lot of emphasis on sulfur and copper use. This also increased Parlier's rating. However, it is my understanding that if DPR monitors for sulfur at all, they plan to use only collection tubes, not dust filters. Sulfur dust CAN NOT be collected reliably with collection tubes. The flow rate and the shape of these monitors are not designed for collecting dust. DPR should either use dust monitors for sulfur or not monitor for sulfur at all. In prior comments to DPR I recommended that they monitor for sulfur dust on a limited basis only, like a pilot within a pilot because I do think that high sulfur dust exposure can contribute to respiratory problems.

  Response: DPR may not agree that it emphasized sulfur and copper use. However, Parlier is still the highest rated community even if we drop sulfur and copper use from the ratings. The background document does not specify the method DPR would use to monitor sulfur. DPR agrees that XAD resin tubes cannot be used to sample for sulfur. ARB has agreed to assist with the sulfur monitoring and DPR will employ ARB's standard method for metals/elements (including sulfur) that uses teflon filters. ARB assistance will add to the monitoring; no resources will be redirected for sulfur. DPR will collect the same number of samples for other pesticides no matter how many sulfur samples are collected.

DPR Response to the
Cal/EPA Environmental Justice Advisory Committee Comments

DPR staff made a presentation on April 5, 2005, to the Cal/EPA Environmental Justice Advisory Committee (CEJAC) on its proposed pilot project in Parlier. The CEJAC made several recommendations. This is the staff response:

- **Re-evaluate the selection of Parlier as the site for the monitoring project. Consider instead a community with more active environmental justice groups, where pesticide drift has been a problem, which have done their own air monitoring and other groundwork, and with a greater interest in and knowledge of pesticides.**

  Response: During the public comment phase of the project, commenters proposed 10 different communities as locations for this project. The only way to fairly select a community was on objective criteria. On these criteria, Parlier scored the highest, by a substantial margin. Parlier had a rating of 10.0 (out of 12 possible). The next highest communities were Arvin and Visalia (8.4), Orange Cove (8.1), London (8.0), Cutler (7.8), and Reedley and Farmersville (7.6). Note that Parlier is 1.6 points higher than the next highest community, and 0.1 or 0.2 points separate most of the other communities. Alternatively, the 1.6 points separating Parlier and the two communities that ranked second is more than the 1.5 points separating the ratings of the next 20 communities (i.e., those ranked second through twenty-second). None of the commenters provided monitoring data, so DPR could not consider this information for its community selection.

  Moreover, the primary goal of the project is to collect meaningful data that will help us reduce environmental health to children. A key component is the availability of cumulative impact data, and the potential for collaboration with other environmental or health monitoring projects. Again, Parlier is notable for several synergistic opportunities.

  While Parlier did not request this project, community and civic leaders have been uniformly supportive and eager to participate. They and DPR are committed to ensuring that public participation is an integral part of the project.

  A key factor in selecting the project community is potentially higher exposure, as indicated by pesticide use data. Some of the communities specifically suggested by commenters, such as Caruthers and Grayson, have lower use than most other communities. CEJAC noted that use of fumigant pesticides in Arvin is much higher than the other communities evaluated. While this is true for the San Joaquin Valley, coastal areas have higher fumigant use than Arvin. Additionally, fumigants were monitored in Arvin in 2001.

In addition, it is important to note that this is a pilot project, and conducting monitoring in Parlier does not preclude monitoring in other communities. The number of communities that have shown an interest in this kind of monitoring demonstrates the wide interest in conducting further monitoring. Limited resources demand that future monitoring sites be selected based on how the data can be integrated and used to enhance protection of health and the environment. For example, little data has been collected from the west side of the San Joaquin Valley, an area with different cropping and pesticide use patterns than other areas. Should resources be available, DPR would propose to conduct additional monitoring on the west side, possibly in Huron, one of the communities suggested by commenters.

DPR may use this or similar methodology to select communities for future monitoring. CEJAC's recommendation also seems to advocate the historical bias of focusing work on selected communities, and neglecting those that lack time/resources or knowledge/experience to bring EJ issues to the attention of government agencies. If we change the selection method so only communities that have existing EJ groups are eligible, future monitoring will be restricted to very few communities.

- **Ensure that the Local Advisory Group (LAG) represents all segments of the community,** including farmers, farm labor, health care professionals, and environmental justice and community organizations, even if it means having members from outside Parlier.

  Response: A local advisory group (LAG) is key to ensuring meaningful public participation in this environmental justice project. DPR has been committed to ensuring that the LAG is representative of both the Parlier community and environmental justice interests. In March and April, the Department solicited applications for the LAG, and in early May, appointed 18 persons to the group. They include representatives of the California Rural Legal Assistance Foundation; Californians for Pesticide Reform; Fresno County Agricultural Commissioner's office; Fresno Metro Ministry; Latino Issues Forum; LUPE (La Unión del Pueblo Entero); Parlier City government; Parlier HEAL Asthma Project; and the Parlier Unified School District. The LAG also includes a local Realtor; a Parlier vintner; three farmers, including an organic farmer; and four members of the Parlier Coordinating Responsibility Authority (CoRA), a group advising the community on revitalization efforts. DPR is soliciting participation of a health care provider familiar with disease patterns in Parlier.

  The first LAG meeting will be at 7 p.m., June 9, at the University of California Kearney Agricultural Center in Parlier. All meetings are open to the public. Subsequent meetings will be at 7 p.m. on the third Thursday of the month, at the Kearney Agricultural Center. Meeting announcements, agendas and minutes will be available on DPR's Web site in both English and Spanish.

- **Consult outside experts (for example, university scientists) on the scientific and technical aspects of the project.**

  Response: We have formed a technical advisory group (TAG) to function as an adjunct to the LAG and to provide informal peer review on air monitoring, modeling, toxicology, pest management, and other technical and scientific elements of the project.

  These agencies and organizations have appointed scientists or technical experts to serve on the TAG:Air Resources Board; California Department of Food and Agriculture (CDFA); California Department of Health Services; California Tree Fruit Agreement, Fresno County Agricultural Commissioner's Office; Latino Issues Forum (Fresno County environmental justice organization); -Office of Environmental Health Hazard Assessment; San Joaquin Valley Air Pollution Control District; U.S. EPA Region 9; University of California, Davis, Center for Health and Environment; University of California, Kearney Center ; and the University of California, San Francisco, VAPHER project (being conducted in Fresno County).

  Additional scientists from a wide range of disciplines within DPR will also serve on the TAG, as will the lead Cal/EPA staff members on cumulative impact, precautionary approach and public participation.

- **Consult with CDFA on data it might provide.**
  Response: We are already using CDFA's data on planted crops, and will ask CDFA to provide other data it believes may be relevant to the project. We will continue to consult with CDFA over the course of the project, and a CDFA representative will be on the Technical Advisory Group.

- **Ensure that the LAG is knowledgeable about pesticide issues by allowing persons outside Parlier that are knowledgeable about drift and about pesticides in general. Contact Teresa deAnda and Marta Arguello (CEJAC members) for their recommendations.**
  Response: Ms. DeAnda and Ms. Arguello were contacted. Ms. DeAnda has been appointed to the LAG, as well as representatives of California Rural Legal Assistance, Latino Issues Forum, Fresno Metro ministry, and LUPE (La Unión del Pueblo Entero).

- **Monitor other sites for comparison; be sure to monitor in a location where pesticides will be found; attach samplers to people to measure air concentrations in the breathing zone.**
  Response: We will monitor one or two other sites if resources allow. Parlier is an area of heavy agriculture, with significant pesticide use, and we believe pesticides will be detected. Monitoring individuals is problematic, however, due to the legal constraints involved in human subjects testing for pesticide exposure. However, DPR will request that UCSF collect this type of data during its project.

- **Put a greater emphasis on precaution and alternatives analysis, in line with the IWG's working definition.**
  Response: DPR's Pest Management Analysis and Planning Program will conduct a study in the project area of cropping patterns, pest pressures, pest control practices, pesticide use, application methods, and alternative pest management techniques, with a focus on integrated pest management. DPR will coordinate its study with ongoing work already being done in the Parlier area: for example, the Almond Pest Management Alliance and Outreach Project; DPR's federally funded project to develop organophosphate alternatives for stone fruit; the Code of Sustainable Winegrowing Practices developed by the California Association of Winegrape Growers and the Wine Institute; and research and extension activities by the world-renowned University of California Kearney Agricultural Center in Parlier, in particular those directed towards the development of ecologically-based pest management systems for insect pests in orchards and vineyards.