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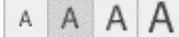
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STOP THE SALT, SAVE OUR JOBS

A "White Paper" on Pajaro Valley water issues

Prepared by the Research Office of the United Farm Workers of America, AFL-CIO
September, 1999

Preface: Conservation Key to Sustainable Agriculture

Five years ago, a group of state and federal agencies were asked to resolve ecological disasters building within the Sacramento-San Joaquin Delta. These government agencies form the CalFed Bay-Delta program, along with the Bay-Delta Advisory Committee, a consortium of representatives from agriculture, the environment and water agencies.

CalFed has proposed various alternatives to resolving the Bay-Delta crisis. It has chosen one alternative as its preferred action. This Preferred Alternative is currently the subject of public hearings. At the hearings, various interest groups have expressed concerns about the Preferred Alternative and its environmental impact report that is supposed to expose the likely affects the Preferred Alternative would have on various entities and interest groups.

Conservation is key in all water management models. The Preferred Alternative includes a Water Use Efficiency Program that would implement greater conservation in urban and rural communities. Conservation is the first step in resolving two critical water problems facing Californians: salinity and water shortages. Salinity is largely caused by overdraft pumping, or pumping too much water out of the system. Therefore, salinity and water shortages can both be minimized through conservation.

Measure K, a United Farm Workers-sponsored initiative on the Nov. 3, 1998 ballot, was approved by voters in the Pajaro Valley Water Management Agency. It requires greater emphasis on conservation in solving serious salt water intrusion in the coastal basin around Watsonville. More importantly, Measure K gives farm workers and other rural residents a greater voice in water use and acquisition.

The UFW has done more than advocate for conservation. The union has also been active in recent CalFed hearings held in Salinas and Visalia to alert all the parties that growers are not the only ones who would suffer from an unreliable agricultural water supply. The United Farm Workers strongly supports sustainable agriculture,



especially when conditions for working conditions in the agricultural industry dramatically improve through mutually-productive collective bargaining relationships between growers and farm workers.

This UFW White Paper was presented to the Pajaro Valley Water Management Agency on Sept. 15, 1999 in hopes the agency and public bodies like it will realize the inevitable necessity of conservation to achieve a reliable water supply and to solve salinity problems.

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Introduction: A New Look at Water

November of this year will mark the first year after the people of the Pajaro Valley Water Management Agency District supported the strong voter mandate for conservation and an end to overdraft. Water management entered a new era with the passage of Measure K.

We are living on the edge of a water crisis in the Pajaro Valley. We use almost twice as much water as our basin can provide. The state has the power to severely ration our water use if we don't bring our water use in line with our available supply. As an agricultural community, we want to avoid the mandatory fallowing of land. Farmers, farm workers and agriculture-related industry all share this interest. In order to protect agricultural land and thousands of farm worker jobs, we must do two things: halt seawater intrusion and end overdraft. If we fail to act now, we could face permanent environmental damage and the loss of local control.

A year ago the PVWMA chose to move forward with a \$36-\$38 million set of three projects that will bring water to select areas of the coast and help begin the recharge of our depleted aquifer. Unless alternative funding sources are discovered, financing these projects will absorb most of the agency's budget for the next 30 years. The local projects were intended to provide 10,000 acre-feet of water a year. It now appears that substantially less water will be developed and that the cost of each element of the projects is on the rise. Currently, our water deficit is 28,000 acre-feet, and this is predicted to increase another 10,000 over the coming years. The local project is not enough. But it is a start.

With the voter approval of Measures D and K in 1998, the PVWMA is now required to:

End overdraft by 2013

Hold and win a vote of the people before moving forward with an import pipeline project

Prioritize conservation and local supply projects

Investigate reclamation and tertiary treatment as other elements of the solution. Studies of these issues must be completed by December 1999.

The PVWMA also faces the constraint that augmentation fees are capped at \$50 an acre-foot. This leaves the agency with very little room to maneuver.

To date, the water agency has focused on increasing the water supply, both within the district and by planning to

import water from the Central Valley. The Agency's Basin Management Plan is built around an import pipeline although the voters have twice shown deep reservations about this project. Before we look outside the district for solutions, we need to understand what is happening within the Pajaro Valley Water Management district. This report examines how we use water, and what the community and the water agency can do to reduce our water use. As a community, we enjoy one of the most beautiful areas in the country, with its fertile soils, coastal climate, and abundant agriculture. We are also faced with some of the most severe water problems in the state. Its time we take action to protect our future.

This report provides an overview of the problems of overdraft and seawater intrusion that plague the Pajaro Valley. We have broken down the major water users into Agriculture, Industry and Residential groupings, and then further into the major water-intensive crops that use most of the area's groundwater. By examining the water use and irrigation practices of vegetable crops, strawberries, raspberries and the major non-agricultural sectors, we are able to offer each group suggestions on how to begin conserving water. Each use profile is followed by a series of suggestions for the user group and the report ends with a series of policy recommendations for the PVWMA. While this report does not offer a comprehensive solution to bringing the basin into balance, it takes the first step - educating residents, workers, growers, elected officials, regulators and others about the problem. Only by reaching out to a broader community can we hope to solve the crisis we face.

Summary of Findings

I. The Pajaro Valley is facing a water crisis which threatens thousands of acres of prime agricultural land and up to 5,800 jobs.

On an average year we pump more than twice the amount of water that this basin can safely yield. As the overdraft continues, seawater intrusion worsens. Well water is being contaminated so that some coastal wells can no longer be used for drinking water or for irrigating crops.

The problems of salt water intrusion and overdrafting the basin have been recognized for decades. The Pajaro Valley Water Management Agency was created 15 years ago in order to deal with these problems. To date, no project has increased the water supply.

If we do not end overdraft and stop the salt from contaminating well water, farms along the coast may be forced to close and thousands of jobs could be lost.

II. Analysis of Water Use and Recommendations for Conservation by Sector

Between 1966 and 1989, water use has risen dramatically. Agricultural water use accounts for approximately 76 percent of the total amount drawn from the basin's wells. The increase in agricultural water use over this time period is more than the amount used by all other water users combined.

Our crops can be irrigated more efficiently. 54 out of the 72 growers evaluated by the Pajaro Valley Water Management Agency's Mobile-Lab received a rating of fair or poor, corresponding to an irrigation efficiency below 80%.

While local crops are grown by a large number of people, a great deal can be accomplished if a handful of the largest growers alter their irrigation systems. Together, these growers could conserve thousands of acre-feet of water each year.

Vegetables also use approximately 20,000 acre-feet (a.f.)* of water, more than any other category, though less than berries on an acre by acre basis. Basic changes in irrigation practices can make a substantial difference to the water basin.

Because strawberries are extremely sensitive to salt, this crop is very vulnerable to seawater intrusion. Growers and workers alike have a mutual interest in stemming water waste in order to preserve agricultural land and jobs for the future.

Raspberries are among the most water intensive major crop in the Pajaro Valley with many growers using over a million gallons of water for each acre on an average year. Basic changes in irrigation practices can make a substantial difference to the water basin.

Vegetable, strawberry and raspberry production is dominated by a small number of large growers. Farms controlled by 30 to 40 individuals use half of the basin's water. If these individuals adopted a conservation program that saved even 10 percent of the water they use, they could save thousands of acre-feet of water.

Residential, commercial and industrial water use make up roughly 20 percent of the total amount of water used in the Valley. Reclamation, the capturing of surface water and conservation offer hopes of significant improvement in water management in these sectors.

III. Policy Recommendations; Moving Towards Sustainable Water Use

According to water agency documents, conservation can yield 9,000 acre-feet. Nonetheless, the PVWMA has failed to make conservation a priority. The PVWMA currently allows inefficient water use as well as late and non-payment of augmentation fees and has failed to enforce requirements to destroy abandoned wells. The PVWMA has sought alter county policies so that they would permit increased well pumping without environmental review. These practices must be changed. The report outlines key elements that should be included in the agency's required conservation program including infrastructure, incentives and disincentive structures to encourage compliance, and innovative programs that have helped other California water districts.

While all water users in each category analyzed can reduce their water use, the PVWMA should focus its efforts on reducing the use of the largest, most intensive water consumers if it wants to see conservation make a big difference. An individual grower can use as much as several thousand households in any given year. It is only logical that individuals who use more than 100 acre-feet of water per year should be the first to participate in a conservation program.

A conservation program will only be effective if compliance is ensured and enforced. A system of incentives to make major cuts in water use, and disincentives or penalties for failure to meet conservation goals will be necessary to make conservation work for everyone.

Facing the Water Crisis

Introduction

The Pajaro Valley's water basin is in a state of severe overdraft. The groundwater which we depend upon for municipal and industrial use, as well as agricultural irrigation is being pumped out of the reservoirs faster than nature can return it. As a result, the levels of well water throughout the Valley are dropping and seawater from the Monterey Bay has begun to contaminate the basin's water supply.

Seawater intrusion was first detected in the Pajaro Valley as early as the 1950's . The problem has worsened in recent years through the addition of irrigated acreage throughout the Valley and the conversion of orchards to more water intensive crops. Seawater intrusion threatens to take thousands of agricultural acres out of production and eliminate thousands of farm worker jobs. As pumping increases, so does seawater intrusion (See Chart 1). Current pumping levels are approximately 68,000 a.f. a year. As a result over 9,000 acre-feet of seawater are moving into the basin on an average year.

Chart 1. Too much pumping results in seawater intrusion

The Valley faces a series of important choices regarding its use of water. It will take a comprehensive approach that considers all potential solutions, while also educating the public about the costs and benefits of different approaches.

The problem is large, and it cannot be solved by any single program. One of the most cost-effective and promising ways to stop seawater intrusion is through conservation. Conservation is the least expensive, the most environmentally sound and the most sustainable long-term solution. In addition to reducing water use, conservation helps keep nitrates and pesticides out of our surface and groundwater.

While conservation is a responsibility that rests on the entire community, it is important that the individuals and industries which use the most of the Valley's water be particularly vigilant in their conservation efforts. Agriculture uses roughly 76 percent of the Valley's groundwater. Moreover, though there are hundreds of growers in the Pajaro Valley, agriculture is dominated by a few dozen large growers who use the lion's share of the resources. If

there is ever to be real change in the water use patterns of the Valley, these large growers must be the community leaders in pioneering conservation efforts.

From Historical Problem to Ongoing Crisis.

Over 95 percent of the water used in the Pajaro Valley comes from well water. With the current pumping patterns including the use of coastal wells, roughly 31,000 a.f. of water can be safely pumped without a significant inflow of seawater from Monterey Bay. Unfortunately, agricultural use alone has long exceeded the safe yield of the basin. The Pajaro Valley Water Management Agency's most recent internal documents indicate that there are 30,120 acres under irrigation with an estimated total water demand of roughly 52,200 a.f.. The largest 10% of vegetable, strawberry and raspberry growers alone use roughly 31,000 a.f. annually. There are several reasons why agricultural water use has increased in the past 30 years.

Between 1966 and 1983 approximately 5,000 acres within the Valley have been converted to farm land and irrigated. Orchards, which require relatively little irrigation, were once the mainstay of agricultural production in the Pajaro Valley. However, orchard acreage has been decreasing for over 50 years. The same period has seen a dramatic increase in the production of water-intensive crops such as raspberries, strawberries and vegetable crops (see charts 2 and 3).

Charts 2 and 3. Orchard acreage has plummeted While the strawberry acreage has expanded. Each acre of strawberries pumps up to four times as much water as an acre of apples.

As a result of these trends, agricultural water use has increased 17,500 acre-feet between 1966 and 1989. The same period has shown a slow increase in municipal water reflecting an increase in the population of the Pajaro Valley. Chart 4 shows that the increase in agricultural water use alone is greater than the amount of water used by all other sectors.

Chart 4. Agricultural water use has risen greatly over the past 30 years.

The current state of overdraft threatens some areas more than others; coastal areas bear the brunt of the impact of district-wide pumping, but we all stand to lose. If major steps are not taken, coastal farms may close, thousands of acres of productive land may be lost and as many as 5,800 jobs may disappear. Many coastal wells are already contaminated with salt, making several of them unusable for drinking water or irrigation. Strawberries are one of the most salt-sensitive of major local crops [see Chart 5]. Strawberry growers therefore have the most to gain by helping stop seawater intrusion by reducing overdraft. Farmers and harvesters alike share a mutual interest in protecting the land and the fruit from salt contamination. While strawberries currently thrive in coastal lands, they must be grown with an eye to the future; they must be grown sustainably.

Chart 5. As salt (chlorides) contaminates irrigation water, crop yields suffer.

Understanding Current Water Use

Water Use in the Pajaro Valley

Overdraft is a Valley-wide problem, but pumping along the coast has an immediate impact on seawater intrusion, as salt water moves inland to fill the vacuum. By shifting pumping patterns away from the coast and moving water from inland areas to the coast for irrigation and residential use, studies show that we can increase the sustainable yield of the basin by 40%, or almost 20,000 acre feet. Local supply projects are needed to produce the water which can be pumped to the coast. This transition should be made as soon as possible so that we can focus on using water in the most efficient way possible.

Efficiency should be the guiding principle for the Valley's water management, the PVWMA, each water using sector from industry to agriculture, and each individual water user.

In order to encourage efficient water use, we have completed an analysis of each of the major water users: commercial, industrial, urban and residential use and the three largest crops which make up the bulk of agricultural production in the Pajaro Valley. Chart 5 provides a comparison of the comparative use of each of the major water-using sectors.

Chart 5. Comparison of Water Use by Sector

The most recent studies indicate that agriculture uses roughly 76 percent of the basin's water or roughly 52,000 acre-feet. A detailed analysis of growing patterns with the Pajaro Valley indicates that for all significant crops, there are a few large growers that dominate production as well as the use of agricultural land and water. Raspberries, strawberries and vegetables are the three largest crops in terms of water use in the Pajaro Valley. Combined, these three crops use 45,000 acre-feet of water? more than 85 percent of the total agricultural use and almost two thirds of total water use in the Valley. While hundreds of growers farm these crops, the bulk of the acreage, and thus the water use for each of these crops, is controlled by a total of roughly thirty large growers. Even minor changes in irrigation practices could help restore the balance between water supply and demand. Table 1 compares the use of major water using sectors in the Pajaro Valley and highlights water-intensive crops which are controlled by relatively few individuals.

TABLE 1. Summary of Water Use by Sector

Water User by Sector	Estimated Total Water Use* (in acre-feet)	Estimated Portion of Total Water Use in the Valley	Estimated Water Use of Top 10% of Growers Within Each Crop
Vegetables	20,507 a.f.	30.1%	12 individuals use 80%
Strawberries	20,034 a.f.	29.5%	10 individuals use 50%
Raspberries	4,500 a.f.	6.6%	7 individuals use 67%
All other Crops	6,659 a.f.	9.8%	
19Residential and Commercial	12,200 a.f	18%	
Industry	4,100 a.f	6%	
Total	68,000 a.f.	100%	

*For the purposes of this report, we have assumed average water use patterns for the large and small growers alike, within each crop and use category. Average water use per crop is characterized in the PVWMA's 1998 Crop Water Use Study.

It is important to acknowledge that there are a variety of factors which can influence a grower's water use. Some are within a grower's control and some are not. Throughout the Valley growers face a variety of microclimates and soil types, which in addition to plant variety and plant density can greatly alter a grower's water needs.

The next sections of the report examine the water use trends for each of the major groups of water users. Each use profile is followed by a number of suggestions on how each group can reduce their water use. Growers, workers, residents, food processors, industrial users, the city and the PVWMA can all play a productive role by helping to turn this situation around.

Vegetables.

Estimated Yearly Water Use: 20,507 acre-feet

Percentage of Total Basin Demand: 30.1%

Local vegetable crops include a wide range of commodities such as leaf and head lettuce, broccoli, cauliflower and artichokes. Unlike raspberries and strawberries, it is typical for vegetables to be double or triple cropped-- that is for there to be two or three plantings of vegetable crops on the same land in a given year. In 1998 the PVWMA released a Crop Water Use Study. Vanessa Bogenholm, a local strawberry grower working under contract with the PVWMA compiled the report over the previous four years. This study calculates the average water use by vegetable crops to be 1.96 acre-feet per acre. This is not a value for a single crop, rather it is an average for one acre assuming that this acre is farmed with the typical cropping patterns within the Valley. Cropping pattern variation can result in a wide range of water demands. In the Springfield region, for example 30% of farms

surveyed use fewer than 1.5 a.f. while 20% use more than 3 a.f.

According to the crop water use study, there are slightly more than 10,000 acres of vegetables in the Valley and vegetables consume slightly more than 20,000 acre-feet of water-- more than all industrial and residential water use in the Valley combined.

The fact that vegetables can be double and triple cropped, compounded with different reporting systems in Santa Cruz and Monterey County makes it difficult to obtain an accurate assessment of the number of vegetable acres farmed or even the ratio of size between two vegetable growers. Despite this, it is clear from examinations of pesticide use permit data, that of the roughly 120 vegetable growers in the Valley, the largest 10 percent-- 12 growers? farm over four times as much as the combined production of the remaining 108 growers (see Chart 6).

Chart 6 Vegetable Production in the Pajaro Valley is controlled by a limited number of large growers

On average each of these large vegetable growers use nearly 1,000 acre-feet of water-- the water use of roughly 5,000 residents. Some growers use much more.

Vegetables; the potential to make a difference

Three central tenets guide conservation practices in irrigation: uniformity, delivering water directly to the root system, and proper scheduling. Together, reaching these goals will ensure the most efficient use of water possible while meeting the needs of the crop in its particular setting (soil type and microclimate).

Vegetable growers can accomplish a great deal of conservation through relatively simple steps. Many vegetable growers continue to irrigate with sprinkler systems, although conversion to drip irrigation can save significantly more water. Growers that continue to sprinkle should avoid sprinkling at high noon, when a significant amount of the water evaporates before reaching the plants. In Arizona, growers that irrigate during the day are fined for wasting water in such an easily avoidable way.

Those growers that do use drip irrigation should use one drip line for each row of vegetables, particularly if farming in heavier soils. Growers using drip irrigation should continually examine their fields for wet spots indicating leaks in the drip lines and should repair these leaks immediately. Leaking pipes and drip tape waste water and can create a hazard for workers who can slip and fall in the mud. All irrigators should be trained to use tensiometers to measure moisture in soil. Tensiometers cost roughly \$30 and are easy to use, but too often growers don't know how to use them. Growers should also level their fields on a regular basis in order to increase irrigation uniformity and reduce overall water use.

The PVWMA must do additional work to provide local vegetable growers with the tools that they need for conservation. The Crop Water Use Study, the PVWMA's most recent and thorough document on agricultural water use in the Valley, does not provide a great deal of guidance for vegetable growers. The document averages all vegetable growers, regardless of crop type or number of plantings. The PVWMA must work to provide growers with accurate estimates of the water needs of specific vegetable crops in specific regions. In addition, the PVWMA should conduct trainings to further the use of Evapo Transpiration (ET) data for irrigation scheduling. ET data can provide extremely accurate information about the actual water needs of a crop given irrigation efficiency, soil type and weather data. The PVWMA should work to bring additional weather stations into the Valley so that weather data in all of the Valley's microclimates is available.

Strawberries

Estimated Water Use: 20,034 acre-feet

Percentage of Total Basin Demand: 29.5%

Watsonville is known as the strawberry capital of the world, and indeed one third of the nation's strawberries come from the Pajaro Valley. As shown above, [Chart 3] Santa Cruz county strawberry acreage has increased steadily for the past 40 years. This is indicative of the trend in the greater Pajaro Valley where strawberry acreage has been between 6,500 and 7,000 acres in recent years.

The PVWMA's Crop Water Use Study states that strawberries use an average of of 2.86 acre-feet of water per

acre each year. Strawberry growers use roughly 20,000 acre-feet of water a year. This is nearly one-third of total water demand and almost equal to the water use of vegetable crops.

Chart 7. There are 103 strawberry growers in the Valley. The top ten growers are as large as the remaining 93 combined.

Assuming average production techniques, the top ten growers strawberry growers each use an average of 1,000 acre-feet of water annually. Average use may even exceed this estimate as many of the premier growers maintain large fields off of San Juan road where PVWMA data shows some of the most intensive water use by grower. As with large vegetable growers, an individual berry grower is often responsible for the same amount of water that can supply several thousand households for a year. This is a huge amount of water for an individual user to be withdrawing from a severely overdrafted basin, and every effort must be made to ensure that the water is being used responsibly and efficiently.

Strawberries: Towards Efficient Water Use

An examination of the crop water use study indicates that there is huge potential for water conservation in strawberries. In every region studied, at least one in four of the growers surveyed used less than 2.5 a.f. of water, yet in each region a substantial percentage of growers using more than 3.0 a.f. In the San Juan region 40 percent of growers used more than 3.0 a.f., in the San Andreas region, approximately 50 percent of growers were above 3.0 a.f.

Strawberry growers can take a number of concrete steps to greatly reduce water use. Full-field plastic mulching, where the entire field is covered with plastic tarp for the duration of the season, can save as much as one acre-foot per acre. According to PVWMA staff, roughly half of strawberry growers use full field mulch, the others only mulch the tops of the beds. Assuming 50 percent of strawberry growers already employ full-field mulch, changing the practice of the remaining 50 percent could mean a savings of 3,500 acre-feet.

It seems that almost all strawberry growers use drip irrigation, though with varying degrees of efficiency. Growers should establish one line of drip tape per row of plants, rather than one or two per bed. This change could reduce water use by 20-30 percent.

According to the author of the Crop Water Use Study, growers have been known to soak fruit destined for processing before it is harvested, in order to increase its weight. If growers were paid by volume of berries rather than by weight this wasteful practice would be discouraged.

Other programs, though applicable to all crops, could result in substantial conservation when applied to strawberries.

Growers should invest in laser leveling to ensure better uniformity of water distribution. Growers should have their irrigation system evaluated for efficiency on a regular basis. The PVWMA should reintroduce its mobile lab services to assist growers in increasing their irrigation efficiency. These evaluations should be required for all growers who use more than 100 a.f. of water a year. The service should be updated and promoted to ensure that all growers take advantage of it.

Raspberries

Estimated Annual Water Use: 4,500 acre-feet

Percentage of Total Basin Demand: 6.6%

Raspberries are the most water intensive major crop grown in the Pajaro Valley. Many growers irrigate each raspberry acre with more than a million gallons of water per acre each year. In San Juan Rd region, some use two million gallons per acre. The Pajaro Valley is one of the largest producers of fresh raspberries in the U.S., with roughly 1,300 acres harvested annually. Pesticide use permits, while inaccurate for determining exact acreage, suggest that in 1998 Pajaro Valley raspberry fields may have covered more than 1500 acres.

According to the Crop Water Use Study, raspberry growers in the Valley used an average of 3.68 acre-feet of water per acre. Our examination of the numbers suggests that the study may have given disproportionate weight

to one region of the Valley where raspberry water use greatly exceeds the Valley average. By weighting the water use by growing region, we estimate the average water use for raspberries is 3.1 acre-feet per acre. Even with this lower number, raspberries are still the most water intensive major crop in the Valley. Our more conservative estimate places average annual raspberry water use at roughly 4,500 acre-feet.

Chart 8. The largest 10% of Raspberry growers farm the majority of the acreage.

All raspberry growers do not use the same amount of water. There are 71 growers who control the raspberry production in the Pajaro Valley. The largest 10 percent of these growers? seven individuals? account for 67% of total raspberry acreage, or twice as much land as the remaining 64 growers. Overall, raspberry production, while practiced by many individuals, is dominated by a limited number of large growers who are organized into shipper groups. Changes made by this handful of growers and shippers would have a dramatic impact on total water use.

Raspberries: Towards Efficient Water Use

According to the crop water use study there is a wide range of water use on raspberry crops. In the region off San Juan road 13 percent of growers surveyed applied over 6 acre-feet of water to their crops annually, over a three year period. This is by far the most intensive agricultural use reported in the Crop Water Use Study, and highlights the need for the PVWMA to focus its conservation efforts on areas and individuals with extremely high water use records.

Raspberry growers often employ sharecroppers. The water agency's Crop Water Use Study of 1998 notes that the use of sharecroppers can result in inefficient water use as irrigation is scheduled according the needs of the sharecropper with the thirstiest portion of the land. Growers often employ many sharecroppers who harvest the same land. One large grower, for example, has employed more than a dozen sharecroppers to grow raspberries.

Raspberry production has changed in recent years with more dense planting resulting in greater water demand. Additional studies may be needed to find the most efficient means of meeting the real water demands of the plants. Because raspberries are such a water-thirsty crop in a region with little water to spare, extra care should be taken to irrigate as efficiently as possible.

Other common sense practices which could be used by all growers including:

Continual examination of drip tape for leaks.
Irrigation applied during cooler periods or at night when water is less likely to evaporate before getting to the plant
Use of ET scheduling to time irrigation
Use of Tensiometers to test soil moisture.

Residential, Commercial and Industrial Use:

Residential and Commercial Water Use: 12,200 acre feet

Residential and Commercial percentage of Basin Demand: 18%

Industrial Water Use: 4,100 acre feet

Industrial Percentage of Basin Demand: 6%

The largest non-agricultural user of water is the City of Watsonville Water Service Area (WWSA) which provides water to Watsonville, Freedom, Corralitos and the Pajaro Dunes residential development. WWSA provides water primarily to residential users but also to commercial and industrial users as well as parks within the Watsonville city limits. In 1988 the WWSA pumped 7,832 a.f. of water.

In addition to the WWSA there are roughly 50 small water purveyors in the Pajaro Valley area which pump from private wells and are responsible for maintaining the safety and cleanliness of their water supplies. The Aromas Water District and Pajaro Community Service District both serve more than 1,000 residents. Most of the purveyors serve fewer than 100.

A significant percentage of residential water is consumed by rural residential users who typically operate their own wells. In 1989 there were roughly 23,700 rural residential water users consuming an estimated 4,100 a.f. annually. Because there are so many rural water users, most of the wells are not metered, making it difficult to get a very accurate assessment of rural residential demand.

Residential water use, both rural and municipal has been increasing slowly, but steadily as more people move into the Valley. Increased residential development will continue to spur additional water use. Compared to the increase in agricultural water use, however, this represents a relatively minor increase.

Industrial water users consume roughly 4,100 a.f. of water annually. About a quarter of this comes from the WWSA supply with the remaining amount from private wells. Almost 90 percent of industrial water demand comes from the food processing industry. Industrial water demand has been quite stable for the past 25 years and the PVWMA does not predict dramatic change in that sector.

Industrial, Residential and Commercial Conservation Potential

Significant conservation measures can begin in the home. The City of Watsonville has taken the lead on the only major conservation program taking place within the district and has made low-flow toilets and showerheads available at low cost. These measures have helped conserve 500 acre-feet so far and have kept urban water use down despite dramatic population growth. This program should be continued and expanded to subsidize low water use washing machines and dishwashers.

Students in local schools should continue to be instructed on the severity of the basin's ground water problems and conservation education should be incorporated into appropriate school programs starting from an early age.

The PVWMA should encourage local ordinances which prohibit the over-irrigation of lawns. The WWSA should join with the PVWMA to pursue a leak detection program to eliminate water loss within its own system.

There is the potential for a great increase in water demand through expanding development of residential and agricultural land. Low density residential and commercial land both use roughly 2 a.f. of water per acre, and higher density development can use significantly more. The city of Watsonville and the counties of Monterey, San Benito and Santa Cruz may consider changes in the zoning plan or the addition of impact fees to insure that new developments provide sufficient financing to purchase supplemental water through environmentally sound solutions.

As noted above, roughly 90% of the industrial water use demand comes from fruit and vegetable processors. There is potential for the reuse of food processing waste water for the irrigation of golf courses or other non-food needs. Because food processing is seasonal, with high demand during the summer, there is potential for large supplies of effluent during periods of high demand. The City of Watsonville should pursue the possibility of using reclaimed water and should expand its filtration plant in order to make use of local surface waters.

THE VOTERS SPEAK

The recently approved voter initiative Measure K requires that the PVWMA move quickly to promote conservation efforts and bring the Valley's water basin into balance. Measure K provides the agency with a mandate to deal with the problem of overdraft by 2013; it states that conservation should be a priority program towards this goal. The measure supports the enactment of local supply projects. It also emphasizes investigation into alternative sources of water such as reclamation and tertiary treatment.

Measures K and D set new priorities for the PVWMA; the agency must focus on local projects and conservation. The agency cannot build a pipeline until 2008 at the earliest, and is required to win voter approval to undertake the project. By passing two measures that placed restrictions on the PVWMA's ability to build the pipeline, and rejecting the Board's Measure L, voters have made it clear that they have deep reservations about the PVWMA's financial management plans.

MOVING TOWARDS NEW SOLUTIONS

This report has analyzed water use patterns within the Pajaro Valley as a first step towards finding the most efficient and cost effective solutions to our water problems. This analysis has demonstrated that the large growers of high water use crops have a great deal of responsibility for the basin overdraft. Small changes in the irrigation

practices of the largest growers have the potential to save thousands of acre feet of water. While we must all work towards finding solutions, real changes must come from the largest water users in the basin.

Many growers in the Pajaro Valley have made headway. Most growers now use drip irrigation and few if any growers in the Valley use such wasteful methods as furrow irrigation. Because most wells are now metered we can track water use and progress in conserving water. While these are positive steps, it is clear that an effective conservation program could have a substantial impact on the Valley's sizable water problems.

According to the agency's 1990-94 Mobile Lab Report, the irrigation systems for 54 out of 72 growers (75%) who participated in the evaluations received a rating of "fair" or "poor". In a region with one of the most severely overdrafted basins in the state these low ratings are unacceptable. The 1998 Crop Water Use study demonstrates that even within small regions of the Valley there are large variations in the amount of water growers apply on a given crop, strongly suggesting that many growers over irrigate.

When the PVWMA was created in 1984, its charter declared conservation to be one of its primary projects. The agency has substantially neglected this fundamental principle. While much of the groundwork has been laid to begin an effective conservation program, the PVWMA has not implemented one. Apart from a city-led project which has saved approximately 500 a.f. each year since 1992, our water district has no substantial conservation program in place.

The agency has recently embarked upon a series of local supply projects, but has found that certain elements are delayed indefinitely, projected yields were overestimated, and cost estimates are already on the rise from \$36 million to \$38 million. While local supply projects are important, they are clearly expensive. The local projects are likely to cost almost as much money as the PVWMA will be able to generate through augmentation fees for several decades while only solving a fraction of the overdraft. This further illustrates the need for conservation? long recognized to be the most cost effective of local projects. PVWMA documents have shown for years that basic conservation measures can save 9,000 a.f. each year, and that conservation measures can be taken at a tiny fraction of the cost of other projects. Chart 9 shows that conservation comes out on top of a cost benefit analysis of solution projects.

Chart 9. Conservation Saves More Water Per Penny Spent than Local Supply Projects or an Import Pipeline

Unfortunately, the PVWMA's has not yet set specific conservation goals or attempted to yield measurable water savings through conservation.

MOVING FORWARD

NEW SOLUTIONS FOR THE PAJARO VALLEY

The PVWMA must follow the lead of other agencies throughout the state that realize that an effective water control plan is needed. To date, the Agency has generally focused on supply issues but has failed to manage growing demand. Because conservation is the right thing to do and because the people of the Valley demand it, the agency must now initiate a conservation program. Such a plan can combine many of these elements:

I. Infrastructure development

Local conservation coordinator. The first recommendation of state and federal advisors to local water districts is to appoint a full time water conservation coordinator. There are some signs that the PVWMA is moving in this direction, but it has not done so to date. It is unlikely that a PVWMA conservation plan will have any success without strong staff support.

Increased use of CIMIS. The PVWMA should bring CIMIS (California Irrigation Management Information System) weather stations to each of the Valley's microclimates. CIMIS stations are relatively inexpensive. The PVWMA should conduct trainings to ensure that growers know how to use CIMIS to their best advantage.

Understand local water use. The PVWMA should update and maintain publicly available information on water use in district. The agency should build a database which links water pumping patterns to cropping data. This could be accomplished largely through coordination with the Monterey and Santa Cruz County Agricultural Commissioner's offices which maintain these public records. This data would be vital in determining whether individual growers are meeting conservation goals.

Set baseline extraction and annual efficiency extraction allocations. Large water users need to be responsible and efficient with our public resource. Accountability mechanisms have been developed by other water districts. Water allocations based on historical use, cropping patterns and irrigation efficiency will develop increase responsibility and accountability of water users to the public. Reasonable goals for use reduction should be set, along with penalties for use levels above baseline.

Prioritize use reduction for the District's largest water users. Individual large water users often consume as much water as several thousand households in and around Watsonville. Because reducing the use of the largest water consumers will have much more beneficial impact than reducing the use of individual residents, the PVWMA should focus its energies on those individuals who use 100 a.f. of water or more per year.

Alternative Sources of Funding. Because Measure D capped the augmentation fees at \$50 per acre-foot, and the PVWMA's recharge project is predicted to absorb almost all of its budget for the next thirty years, the agency will have to look to alternative funding mechanisms including impact assessments for development or changes in land use that involve an increase in water use, fines and penalties for water wasters, and new hook-up fees. All fees should be paid promptly to the PVWMA or incur cumulative penalty charges.

II. Concrete program with enforcement

Concrete goals. Because wells are metered, the PVWMA will be able to measure the impact of specific conservation measures - but concrete goals must be set and met. The conservation coordinator should establish long term and short term goals to achieve high levels of conservation. Goals should include scheduled reasonable reductions in water use for the major water users in the Valley.

Individual conservation plans. The conservation coordinator should insure that all growers maintain an individual conservation plan. The plans should be reviewed periodically and annual irrigation efficiency audits should be used to ensure that the plans are being followed. These conservation programs and independent evaluations should be available to the public.

Penalties for wasteful practices. The PVWMA should establish a list of wasteful practices including maintaining leaky pipes, and using sprinklers during sunny days or windy conditions. Growers found to be engaged in wasteful water practices should face financial penalties.

Provide incentives for conservation. Growers should be given a baseline of how much water they should be using, given the crops they plant and climactic conditions (including soil type) that they face. Growers which exceed their baseline water use limits should receive financial penalties, while those whose water use falls below 80% of their baseline could receive financial incentives through reductions in their augmentation fee charges.

III. Technical support.

Reintroduction of the mobile lab. As noted above, in the past the PVWMA maintained a mobile lab to help growers increase irrigation efficiency. The lab was eliminated for lack of interest but has recently been reintroduced on a limited basis. The lab should be permanently reinstated and heavily promoted especially among the largest water users. A similar program should be made available to Pajaro Valley residents and businesses.

Local solutions. The PVWMA should conduct its own studies on farming practices specific to the Pajaro Valley's crops and climate to give growers all the information that they need to irrigate efficiently.

Work with state and federal agencies. The California Department of Water Resources (DWR) has established a list of Best Management Practices for agricultural irrigation which several local water agencies have signed on to. Many of these recommendations include the use of CIMIS and conversion to drip irrigation systems. The PVWMA should endorse these practices and seek to ensure that growers within the PVWMA district follow best management practices.

Several water agencies including Fox Canyon Groundwater Management Agency are achieving significant results by implementing strong conservation programs incorporating disincentives to waste water. These programs may be controversial, but this political battle will be much smaller than the environmental and economic crisis it will help us avoid. If an aggressive conservation program is not implemented now, then we can expect land fallowing and thousands of jobs lost in the future.

While many difficult decisions remain, the Pajaro Valley has already made the most important choice. By approving Measure K the community has demonstrated the importance of acting now to preserve the unique characteristics of this special Valley. The PVWMA must move forward to follow the mandate of Measure K. Failure to act risks massive job loss and land deterioration as well as state intervention and adjudication of water rights which would be in no one's best interest. The problems we face are severe but we can make a difference in pursuing environmentally and economically sound solutions.

Appendix A

Sources and Methodology

We analyzed the relative size of growers within the Pajaro Valley Water Management Agency District through an examination of the 1998 pesticide use permits filed in the portions of Monterey and Santa Cruz Counties contained within the PVWMA district. Data for non-agricultural pesticide use was filtered out, as was uncultivated agriculture and all permit applications which expired prior to January 1, 1998. Crops were then grouped: Raspberry, Bushberry, Strawberry, Vegetable, Orchard, Outdoor Nursery and Greenhouse. For the purposes of this study "Undeclared Commodity" was assumed to be vegetables. According to discussions with the Santa Cruz County and Monterey County Agricultural Commissioner's office, this is true for almost all of the acreage in Santa Cruz County and much of the acreage in Monterey County. As noted above, different cropping patterns between vegetables and other crops, as well as different reporting standards for vegetables in Santa Cruz and Monterey Counties makes it difficult to use pesticide permits to compare acreage between vegetables and other crops. The information contained within the pesticide use permits is sufficiently reliable, however, to provide good estimates of the relative size of different growers within the PVWMA district and serves as a useful tool in furthering the understanding of the key water users within the district.

Several of the sources cited in this report are based upon data compiled in 1989. We used the most recent information provided to us by the PVWMA, and through extensive research, found the data to be as accurate as any available. These documents, including the 1993 Basin Management Plan continue to serve as the basis for the water agency and board's decision making. We therefore took the data to be adequate for the purposes of this analysis.

Endnotes

1. Pajaro Valley Water Management Agency Basin Management Plan, Main Report, Volume 1, 1993. (Figure 7-5).
2. Santa Cruz and Monterey County Pesticide Permit Data. (See Appendix A).
3. Historical and Future Water Use Pajaro Valley Water Management and Augmentation Study, James M. Montgomery, Consulting Engineers, July 1990. pp. 3-5. (Note: This is a draft document which was never finalized. Its results were incorporated into the PVWMA Basin Management Plan).
4. Santa Cruz County Crop Reports, 1960-1995; Pajaro Valley Water Management Agency Crop Water Use Study, Vanessa Bogenholm, March 1998 p. 5.
5. Historical and Future Water Use, Figure 5, Figure 8.
6. Based on analysis of recent cropping patterns in the coastal area of the Pajaro Valley. Uses EDD data to estimate peak labor requirement for each crop.
7. The Role of Leakage in the Seawater Intrusion of a Confined Coastal Aquifer, Linda Darlene Bond, August 1986, p. 381.
8. Basin Management Plan, 1993 Volume 1, p. 7-7, Figure 7-5.
9. State Water Conservation Coalition Agricultural Conservation Task Force, Policy Statement on Efficient Water Management for Conservation by Agricultural Water Suppliers, On Farm Practices, March 1994.
10. Historical and Future Water Use, Figure 3.
11. Crop Water Use Study.
12. Santa Cruz and Monterey County Pesticide Permit Data. (See Appendix A)
13. California Water Plan Update, Bulletin 160-98, Department of Water Resources, p. 4-16. Based on daily per capita use of 179 gallons for Central Coast residents.
14. Crop Water Use Study.
15. Santa Cruz and Monterey County Pesticide Permit Data. (See Appendix A)
16. Crop Water Use Study, pp. 15, 17, 22, 26, 29.
17. Ibid.
18. Ibid. p.35
19. Crop Water Use Study; analysis of cropping patterns based on Santa Cruz and Monterey County Pesticide Permit Data.
20. Santa Cruz and Monterey County Pesticide Permit Data. (See Appendix A)
21. Crop Water Use Study, pp. 28.
22. Ibid., 35-6.

23. Historical and Future Water Use, Figure 3.
24. Ibid., Figure 5.
25. Ibid., p. 3-3.
26. Basin Management Plan, 1993 Volume 1, p. 5-6.
27. Historical and Future Water Use, p. 3-4.
28. Ibid., pp. 3-4, 3-5, 4-6.
29. Mobile Lab Report: Summary of Results, 1990-1994, Charles McNiesh and Vanessa Bogenholm, July 28, 1994

Additional Sources for Conservation Recommendations

MCWRA Water Conservation Program Summaries for 1995 and 1996.

PVWMA "Water Conservation Measures", 1990.

State Water Conservation Coalition Agricultural Conservation Task Force,
Policy Statement on Efficient Water Management for Conservation by
Agricultural Water Suppliers, On Farm Practices", March 1994

For a copy of "Stop the Salt, Save our Jobs", complete with graphs, call 831-761-7174.



EXHIBIT 10

8/1/01

8/1/01

All signs point to help for wineries

VINTNERS APPLAUD CHANGES

By KEVIN HOWE

khowe@montereyherald.com

A package of goodies for Monterey County's wine industry was approved Tuesday by the Board of Supervisors.

With the backing of the county's hospitality industry, grape growers and vintners had sought changes in county policy on road signs and the permit process to help them promote the county as a wine production center.

"It bridges the hospitality and agriculture industries," said Kurt Gollnick of Sheid Vinyards, president of the Monterey County Vintners and Growers Association.

Wine-related tourism also would help provide year-round employment for agricultural workers, he said, and offer great potential for growth in winemaking, processing, packaging and sales.

In April, the wine growers pointed out that while Monterey County is the second-largest grape producer in the state, it lags far behind other wine regions in numbers of wineries, wine-tasting rooms and processing plants. Though

the county is home to 45,000 acres of wine grapes and seven identified viticulture areas, it has only 21 wineries and 15 tasting rooms.

San Luis Obispo County, with less than half the acreage, has four times the number of wineries.

Wine revenues account for \$280 million of the \$380 million in annual grape receipts, according to Amanda Robinson, executive director of the Vintners and Growers Association.

The industry has gross assets in the county of \$870 million, and an \$81 million annual payroll.

The county ships 75 percent of its grapes elsewhere for processing, said county Agricultural Commissioner Eric Lauritzen, who added that the policy changes are intended to focus on developing more wineries rather than expanding vineyard acreage.

There is a potential of developing up to 100,000 acres of land for vineyards, he said, but "that will be driven by water

Please see Wineries page E2

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Vineries

W/ page E1

availability, not available land."

By unanimous vote, the supervisors agreed to:

- Direct the county Public Works Department to put up directional signs at wineries.
- Direct the county General Plan Update Committee to develop wine industry-friendly planning regulations.
- Direct the county Planning and Building Inspection Department to continue processing existing winery permit

applications, provide a winery permit informational brochure, application process booklet and application process package, and train planning staff in winery permit processing.

North County residents Jan Mitchell, Julie Engel and Carolyn Anderson took issue with some of the proposals.

More grape growing will aggravate the county's existing water shortage, Mitchell said, and more tourism will add to existing highway congestion, while woodlands will be plowed under for vineyards. Anderson said county officials once

considered off-site business signs "rural blight" and worked to eliminate them.

County analyst Lynn Mounday said the county is planning directional, not advertising, signs and said that traffic and environmental issues are being reviewed as part of the county's general plan update.

Vineyards provide open space on land that would otherwise be subdivided and developed, said Supervisor Lou Calcagno. And as for water, he added, landowners have been paying for the county's water supply for years and are entitled to their share.

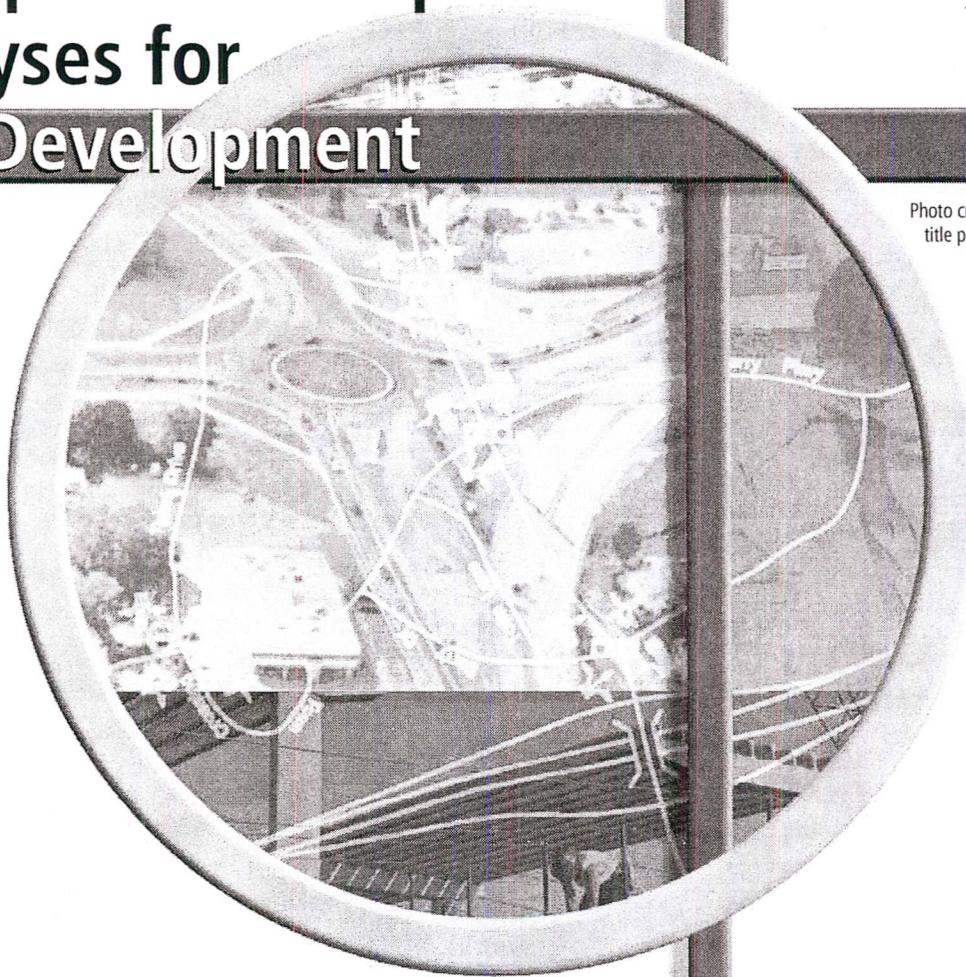
"It's a balancing act," said Supervisor Fernando Armenta. "You can't be completely environmental or completely corporate."

Supervisor David Potter noted that signs and wines are sensitive issues in Carmel Valley, the heart of his district. His motion to approve the wine package included a clause that would require signs in the valley to be approved by the Carmel Valley Road Committee.

Kevin Howe can be reached at 753-6771.

Transportation Impact Analyses for Site Development

Photo credit: Roundabout photo on cover and
title page, Cindy Schwartz and George Pen



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Table 2–3. Suggested Study Area Limits for Transportation Impact Analyses

Development	Study Area
Fast-food restaurant	Adjacent intersection if corner location
Service station, with or without fast-food counter	Adjacent intersection if corner location
Mini-mart or convenience grocery with or without gas pumps	660 ft. from access drive
Other development with fewer than 200 trips during any peak hour	1000 ft. from access drive
Shopping center less than 70,000 sq. ft. or Development w/peak-hour trips between 200 and 500 during peak hour	All signalized intersections and access drives within 0.5 miles from a property line of the site and all major unsignalized intersections and access drives within 0.25 miles
Shopping center between 70,000 and 100,000 sq. ft. GLA or Office or industrial park with between 300 and 500 employees or Well-balanced, mixed-use development with more than 500 peak-hour trips	All signalized and major unsignalized intersections and freeway ramps within 1 mile of a property line of the site
Shopping center greater than 100,000 sq. ft. GLA or Office or industrial park with more than 500 employees or All other developments with more than 500 peak-hour trips	All signalized intersections and freeway ramps within 2 miles of a property line, and all major unsignalized access (streets and driveways) within 1 mile of a property line of the site
Transit station	0.5-mile radius

SOURCE: Adapted from Stover and Koepke 2002 and Barbara M. Schroeder.
GLA = gross leasable area

Works Cited

Florida Department of Transportation. 1997. *Site Impact Handbook*. Tallahassee, FL: Florida DOT. pp. 13–15.

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Institute of Transportation Engineers. 2003. *Trip Generation*. 7th ed. Washington, DC: ITE.

Stover, Vergil G., and Frank J. Koepke. 2002. *Transportation and Land Development*. 2nd ed. Washington, DC: Institute of Transportation Engineers.

References for Further Reading

Edwards, John D., Jr., ed. *Transportation Planning Handbook*. 2nd. ed. Washington, DC: Institute of Transportation Engineers, 1999.

Keller, Richard, and Joe Mehra. *Site Impact Traffic Evaluation Handbook*. Washington, DC: Federal Highway Administration, 1985.

EXHIBIT 12



Autumn Wind Associates, Inc.

Air Quality CEQA Analysis and Consulting Services

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916.663.2222 ▪ Cell 916.719.5472 ▪ www.autumnwind.us

25 Jan 2009

Mr. John Farrow
M.R. Wolfe & Associates
49 Geary Street, Suite 200
San Francisco CA 94108

RE: Monterey County General Plan DEIR

Dear Mr. Farrow:

I am pleased to submit the following comments regarding the Draft Environmental Impact Report (DEIR) for the proposed Monterey County 2007 General Plan.

I. Misleading Analysis Scenarios (AQ-1 & AQ-3)

The analysis scenarios provided in the DEIR for two air quality impact analyses, AQ-1: Consistency with Air Quality Plans, and AQ-3: Criteria Pollutants, are unnecessarily confusing and poorly described, thus making it difficult to determine if any of the scenarios disclose the actual project specific impacts of the proposed General Plan relative to baseline conditions. The scenario descriptions contain errors that mislead the reader and further complicate any meaningful interpretation of the results. For example, in Table 4.6-11 the scenarios titled “Existing plus Project Buildout” and “Existing plus Project (2030)” would appear to be based on the same General Plan assumptions with results for two different years. However, only one scenario is actually based on the proposed General Plan. The “Existing plus Project (2030)” scenario is not based on the proposed General Plan, but instead on AMBAG development projections made in 2004 (DEIR, 4.6-23).¹ Since the two scenarios are not based on the same assumptions, the scenario names should not imply that they are. By doing so, the DEIR masks the implications of the data within each scenario.

¹ The scenario descriptions on pages 4.6-22 through 4.6-28 state that the 2007 General Plan is the basis for the “Existing plus Project Buildout”, “Cumulative 2030”, and “Cumulative Buildout” scenarios. The “Year 2000” scenario is the baseline, and the “Existing plus Project (2030)” scenario is based on an AMBAG 2004 forecast.

II. Flawed Air Quality Significance Determination Caused by Incomplete Analysis

To properly analyze and disclose the impacts of the proposed General Plan, the DEIR must identify the growth allowed by the proposed General Plan in the unincorporated area and must then disclose the emissions resulting from unincorporated area growth in 2030. The DEIR fails to provide this fundamental analysis scenario (see scenario descriptions at DEIR page 4.6-21 through 4.6-28). The only two scenarios that provide unincorporated area impacts while holding incorporated areas constant are the “Existing plus Project Buildout” scenario (which is not useful for determining 2030 growth), and the “Existing plus Project (2030)” scenario (which is based on 2004 AMBAG assumptions, not the General Plan). The DEIR does not include a 2007 General Plan growth scenario with incorporated areas held constant, therefore it fails to provide the most basic data necessary to determine General Plan impacts.

In fact, the DEIR does not explain which scenario supports the significance conclusion that Impact AQ-3 is less than significant for all but winery emissions. (DEIR, 4.7-29). The DEIR attempts to imply that emissions are reduced under the proposed General Plan by showing emissions reductions under the “2030 Project Increase” scenario in Table 4.7-6. Such a conclusion is flawed for at least two reasons: 1) the “2030 Project Increase” scenario is based on 2004 AMBAG growth projections, not the proposed General Plan, and 2) the apparent emissions reductions actually result from improvements in vehicle and fuel technology, not anything associated with the proposed General Plan (this flaw in claiming technology benefits is described in more detail later in this letter).

The flawed air quality analysis and significance determination is further evidenced by frequent inconsistent and contradictory statements in the DEIR. For example, the “Significance Determination” section of Impact AQ-3 states, “Implementation of the 2007 General Plan would result in increased emissions of criteria pollutants and VOCs.” (DEIR, 4.7-26) But then the “Significance Conclusion” section of Impact AQ-3 states that, “...implementation of the 2007 General Plan would result in a decrease in ROG, NO_x, CO, PM_{2.5}, and PM₁₀ emissions.” (DEIR, 4.7-28)

III. Quantification Inconsistencies

Table 3-8 in the Project Description chapter of the DEIR shows that 10,015 new residential units are planned in unincorporated Monterey County by 2030. Table 4.6-11 in the Transportation chapter shows that under the “Cumulative 2030” scenario, housing units in the unincorporated area increase from 35,252 units to 48,690 – an increase of 13,438 dwelling units. Inconsistencies within the DEIR related to critical information such as housing growth should be corrected so that all analyses are based on the same assumptions.

Inconsistent information in the DEIR continues with the representation of existing conditions in Table 4.6-11. The DEIR states that existing conditions are based on 2008 roadway conditions. (DEIR, 4.6-22). But the only existing condition, or environmental

baseline, in Table 4.6-11 is for “Year 2000”. The DEIR should have provided population, housing, and employment data specifically for the year 2008 baseline. The same 2008 baseline scenario should have been the basis for VMT and emissions estimates found in Table 4.7-3, 4.7-5, and 4.7-6. Travel modeling and emissions modeling specific to the 2008 environmental baseline should have been performed and consistently used throughout the DEIR. Since vehicle travel and emissions vary over time, the use of two different baseline years leads the DEIR to unreliable travel and emissions conclusions.

IV. Failure to Properly Substantiate Air Quality Analysis Assumptions and Methodology

The claimed emission impacts of the various analysis scenarios are not substantiated by evidence in the DEIR or supplementary information provided by Monterey County. Table 4.7-5 of the DEIR contains a summary of emissions modeling results for five analysis scenarios. It is impossible to verify the accuracy of these results since the DEIR does not include a complete description of the assumptions and methodology that directly result in the claimed emissions. Although the DEIR claims that Appendix A contains the necessary data and method descriptions, it does not. Appendix A is the Notice of Preparation.

An October 3, 2008 letter from Wendy Strimling, County of Monterey, to John Farrow, acknowledged that the reference to Appendix A was a “typo.” Ms. Strimling’s letter also responded that there was no source document for Table 4.7-3, that it was prepared by Kimley-Horn and Associates, that its population and employment projections were based on Section 4.6.3.1 and 4.6.3.2 of the DEIR, and that VMT for each scenario was developed using the AMBAG travel demand forecasting model. Then, on October 7, 2008, the County provided a two-page document titled “Air Quality Technical Information”, a similar document related to Carbon Monoxide modeling, two printouts from the EMFAC 2007 emissions model, and summaries of population and housing for traffic analysis zones (TAZ) prepared by Kimley-Horn and Associates. Although this supplementary information improves on the DEIR’s complete lack of substantiating data, it remains incomplete and still does not allow for independent review of the emissions estimate accuracy. There is no transparent connection between the data and explanation provided by the County during October 2008 and the emissions estimates claimed in Table 4.7-5.

Specifically, the supplementary information provided by the County in the “Air Quality Technical Information” document includes a general description of the EMFAC 2007 model and a two-paragraph description of modeling procedures. From the scant information provided, it appears that the traffic modeling was far too simplistic to provide meaningful results. For example, the modeling was based on the same average traffic speed assumption (23 mph) for each analysis scenario in both 2008 and 2030². Instead, traffic speeds should vary based on the type of roadway (such as residential street versus

² County of Monterey, “Air Quality Technical Information”, Table 1, p. 2.

highway), roadway capacity during different analysis years, changes in the type and density of development, and other traffic and land use variables. Essentially, the General Plan would result in population and VMT growth, which should change the amount of congestion assumed in the traffic modeling, which in turn would be expected to change traffic speeds over time. According to the County's description, only "selected roadway segments" were adjusted to account for congestion. But there is no disclosure of which roadways were "adjusted" and no disclosure of the range of adjustments made. Were these adjustments limited in scope to just speed, or were other adjustments made such as vehicle volume (trips and VMT), roadway capacity, or were there other changes? Were the adjustments made for the 2008 scenario different than the adjustments made for the 2030 scenario? If so, how did they differ? Presumably, the traffic modeling performed by the County's consultant included more detailed assumptions, but that information is not provided in the record. Since emissions are directly related to traffic modeling, the vehicle emissions results claimed in the DEIR have not been adequately supported.

Similarly limited information provided by the County on October 7, 2008 appears in the four attachments showing population, housing, and employment in each traffic analysis zone (TAZ). Presumably, each of the four attachments corresponds to one of the DEIR analysis scenarios. But the attachments are not titled or described consistent with the DEIR scenario titles. As an example of the naming inconsistencies, one of the attachments is titled "Existing Buildout of Project LU Summary by TAZ-2". Is that attachment meant to document assumptions for the "existing" scenario or the "buildout" scenario? And there are only four attachments; one short of the five scenarios in the DEIR. Not only did the County fail to explain how the attachments correlate to the scenarios in the DEIR, there is no documentation of the source of the data. Upon what did the County base the population, housing, and employment projections in each of the four attachments? Are those sources consistent with sources for similar data claimed in the DEIR? The failure to substantiate these assumptions further calls into question the validity of the DEIR traffic modeling, as well as the resulting emissions impacts.

V. Inconsistency with Air Quality Management Plan

Impact AQ-1 of the DEIR claims that conflicts with the Air Quality Management Plan are less than significant (DEIR, 4.7-13). Impacts are evaluated separately for the 2030 Planning Horizon and for Buildout in 2092. The DEIR improperly concludes that 2030 Planning Horizon impacts are less than significant (DEIR, 4.7-17). In making this incorrect determination, the DEIR makes factual errors in reference to population projections in the Air Quality Management Plan (AQMP) adopted by the Monterey Bay Unified Air Pollution Control District (MBUAPCD).

The DEIR claims that the population projected in the MBUAPCD "Clean Air Plan"³ is 602,371 in 2030. This claim is inaccurate and overstates the population projection in the MBUAPCD Plan. In fact, the MBUAPCD Plan projects a Countywide population of

³ The DEIR refers to the MBUAPCD "Clean Air Plan", which more accurately is titled the "2008 Air Quality Management Plan."

only 515,549 in 2030⁴. The 2030 Cumulative population projection of 602,790 in Table 4.7-3 of the DEIR is significantly higher than the MBUAPCD Plan and therefore should have been identified as a significant impact. Note that the 2030 Cumulative population estimate in the DEIR is higher than the MBUAPCD Plan for both the Countywide estimate as well as the unincorporated area alone estimate.

VI. Improper Association of Vehicle and Fuel Technology Improvements with the General Plan Result in Faulty Criteria Pollutant Significance Conclusion

The DEIR concludes that impact AQ-3, the net change in ozone precursors and particulate matter, is less than significant except for winery emissions. (DEIR 4.7-29) The basis for this conclusion is summarized by the statement "... [I]mplementation of the 2007 General Plan would result in a decrease in ROG, NO_x, CO, PM_{2.5}, and PM₁₀ emissions." (DEIR, 4.7-28) It is inaccurate to claim that the General Plan results in a net decrease in emissions. The General Plan would result in growth, and that growth would increase emissions. The emissions increase is virtually certain to be a significant impact not identified in the DEIR.

Population and VMT increase under the General Plan, therefore emissions from mobile sources must necessarily increase. Table 4.6-11 shows that under the "Cumulative 2030" scenario, housing units in the unincorporated area increase from 35,252 units to 48,690 – an increase of 13,438 dwelling units. Table 4.7-6 shows that annual VMT increases by 369,679 under the "2030 with Project" scenario.⁵ The only scenario under which mobile source emissions would not increase under growth conditions is if all incremental VMT were produced by zero emission vehicles (electric, fuel cell, or other future technology). Even under such unlikely conditions, emissions would not decrease because of the proposed 2007 General Plan. Emissions could only decrease if VMT were reduced, and the DEIR does not claim net VMT reductions.

The apparent reduction actually results from vehicle and fuel technology improvements that reduce emissions from the *existing* vehicle fleet. The proposed General Plan has no impact on vehicle technology benefits, and the emission reductions are completely independent of General Plan policy. State and federal motor vehicle emission standards are responsible for emission reductions resulting from vehicle and fuel technology improvements. Mobile source emissions are reduced within Monterey County as older vehicles are replaced with newer, less polluting models. It is inaccurate for the General Plan DEIR to claim emissions reductions from vehicle technology because those reductions will occur with or without approval of the General Plan. This is an especially

⁴ MBUAPCD, 2008 Air Quality Management Plan, August 20, 2008 Revision, Table 1-1, pg. 1-4.

⁵ Note that the "2030 with Project" scenario used in the DEIR to estimate the VMT increase of 369,679 is based on AMBAG traffic modeling from 2004. The VMT increase should have been modeled using conditions under the proposed General Plan. Since the DEIR does not identify VMT increases specific to the unincorporated area under the 2007 General Plan, the "2030 with Project" scenario is used in this comment.

important error since the significance determination for impact AQ-3 is based on these reductions.

To correct for this error, the DEIR should have modeled emissions from existing vehicles (baseline VMT) and new vehicles (VMT growth) in the same 2030 planning horizon. Specifically, the baseline emissions in Table 4.7-6 should have been calculated as the VMT from the year 2000⁶ occurring during the year 2030. The EMFAC 2007 model used for all the scenarios in the DEIR should be used to calculate this scenario. Using this modeling approach would “zero out” emissions reductions caused by vehicle technology improvements. This corrected baseline scenario would allow for the disclosure of emissions associated with VMT growth under the proposed General Plan, which is fundamental to understanding the specific emissions impacts of the proposed General Plan.

VII. Lack of Connection Between Growth Assumptions and Traffic Modeling

The DEIR concludes that “Implementation of the 2007 General Plan would result in the development of new urban areas and new infrastructure in the Community Areas, Rural Centers, and AHOs.” (DEIR, 4.1-14). There is no transparent connection between the growth resulting from these specific land use changes and the traffic and emissions modeling described in the DEIR. Other than the data presented by Planning and Community Areas in Table 3-8, the DEIR does not disclose specifically where growth in employment and housing is projected to occur and how that growth was added to the assumptions used in traffic modeling, which forms the basis for the VMT estimates used in emissions modeling. In response to LandWatch’s request for the assumptions used for the traffic and air quality analyses, the County provided the incomplete and inadequately described sets of population, housing, and employment data by TAZ discussed above. As noted, the information provided does not enable the public to determine how the DEIR actually projected growth as a consequence of the 2007 General Plan.

The specific location of planned new growth is critical information and is necessary to determine the emissions impact of the general plan, but this information is not provided in the DEIR. This is especially important because the DEIR describes the intent of the County to not perform project level CEQA analysis for projects that are consistent with the General Plan:

“Where projects are found to be consistent with the development density established by the 2007 General Plan and within the scope of the EIR certified for that Plan, additional environmental review will not be necessary...” (DEIR, 3-9)

The County will not be able to accurately determine consistency of future projects unless the General Plan DEIR detailed growth assumptions for each year through 2030 at the

⁶ The DEIR provides year 2000 VMT in Table 4.7-3. As explained previously, the DEIR should instead provide year 2008 data as the baseline.

parcel level, or at least TAZ level. By not providing this detail in the General Plan DEIR, there is not sufficient baseline data upon which to determine whether future development projects are consistent with planned development density.

Thus, the DEIR lacks the data necessary to properly evaluate project-specific impacts, and improperly concludes that future project-specific environmental review is not necessary.

VIII. Faulty VMT Assumptions

Comparison of the DEIR's estimates for VMT growth to the population growth estimates show that either the traffic modeling or population estimate is based on flawed assumptions. Table 4.6-11 shows that under the "Cumulative 2030" scenario, population increases from 95,047 to 131,213 – an increase of 36,166 people. Table 4.7-6 shows that annual VMT increases by 369,679 under the "2030 with Project" scenario.

If the population and VMT estimates are correct, this would mean that each new resident drives just over 10 miles per year. Clearly, this is unrealistic.

IX. Construction Impacts are Not Mitigated to Less Than Significant Level

Impact AQ-2 discusses construction related particulate and ozone precursor emissions. Despite the fact that construction emissions are a "large source of NOx and diesel particulate matter," (DEIR, 4.7-18) the DEIR does not provide a quantitative analysis of construction emissions and potential significant impacts. This is an unacceptable oversight especially in light of the County's intention to rely on this DEIR instead of performing project-specific environmental review for future development projects. Even the qualitative discussion in the DEIR does not adequately support the claim that construction related impacts are mitigated to less than significant.

First, the DEIR claims that only PM10 emissions are potentially significant (DEIR, 4.7-20). In addition to PM10, the DEIR should have identified ozone precursors (ROG and NOx) as a potentially significant impact. The DEIR states that ROG and NOx emissions have been included in the regional emissions budget, and presumably relies on this to exclude ozone precursors from the determination of potentially significant impacts. The apparent presumption is that emissions included in an emission inventory need not be analyzed. This is clearly inconsistent with CEQA requirements. Fundamentally, all emissions from all known sources are included in the emission inventory, and virtually every emission control program at the federal, state, and local level is designed to reduce emissions that are documented in an emission inventory. Therefore, construction emissions of ozone precursors are a critical component of the overall emissions impact of the proposed General Plan. If ozone precursor emissions cannot be mitigated to less than significant levels, those emissions must be identified as a significant impact.

Regarding PM10 emissions, the DEIR relies on Mitigation Measures AQ-1 through AQ-3 to reduce impacts to less than significant. The determination of less than significant impacts is flawed for several reasons. First, Mitigation Measure AQ-1 proposes a “revision” to General Plan policy OS-10.5 to require implementation of MBUAPCD PM10 control measures. But this suggested mitigation is at best vacuous since General Plan policy OS-10.9 already requires implementation of MBUAPCD control measures.

The DEIR’s treatment of the “revision” as an *additional* mitigation measure makes it clear that, despite the DEIR’s recitation of proposed General Plan policies, *including Policy OS-10.9*, as the basis of its impact analysis (DEIR, pp. 4.7-18 to 19), consideration of these policies did not actually inform the DEIR’s significance conclusion. Note also that the DEIR recites that “there are no policies applicable to air quality” in the South County, Toro, and Central Salinas Valley Area Plans, but then concludes that the South County, Toro, and Central Salinas Valley Area Plan air quality policies “would reduce air quality impacts in the AWCP area that overlays these Planning Areas (DEIR, p. 4.7-19). The inconsistencies and apparent failure to consider the content of the recited General Plan policies demonstrate the inadequacy of the DEIR’s qualitative evaluation of construction impacts.

Furthermore, the “revision” of OS-10.5 proposed as Mitigation Measure AQ-1 could *increase* operational emissions since the change would replace an unrelated and otherwise beneficial policy related to encouraging mixed land uses that reduce VMT.

Second, Mitigation Measure AQ-2 proposes a revision to General Plan policy OS-10.6. But that policy already supports MBUAPCD “air pollution control strategies, air quality monitoring and enforcement activities”. The proposed revision would actually weaken the policy by limiting its application to off-road and heavy equipment emissions.

Third, Mitigation Measure AQ-3 relates to operational emissions, not construction emissions, and therefore would not reduce construction impacts. In total, the proposed mitigation would do nothing to reduce construction emissions and might actually increase emissions.

X. Health Risk From Diesel Particulate Matter is Not Mitigated to Less Than Significant (Localized Risk)

The DEIR concludes that Impact AQ-4 related to the health risk from exposure to diesel particulate matter is less than significant after mitigation (DEIR, 4.7-30). The conclusion is not supported by any quantitative analysis, but rather by vague and unsubstantiated statements combined with misrepresentation of risk assessment protocols established by the State of California.

The DEIR correctly points out that risk assessments performed to determine cancer risk from diesel particulate exposure are typically based on a 70-year exposure period. But then the DEIR dismisses the localized risk because 1) the duration of individual construction projects is less than 70 years, and 2) “exposure will be minimal due to the types of proposed projects” (DEIR, 4.7-30). Both of these statements, intended to

support the less than significant determination, are insufficient. The 70-year exposure period is a health risk assessment modeling parameter established by the California Office of Environmental Health Hazard Assessment.⁷ The exposure period is meant to be consistent with an expected human lifetime, and should not be interpreted to limit applicability to sources that emit toxics for at least 70 years. In fact, most toxic sources affect an individual human receptor for less than the human's entire life, either because the source changes its location or emissions intensity, or the human receptor moves to a new location. Nevertheless, OEHHA recommends the 70-year exposure timeframe even if the impact duration is shorter. The second justification statement, that somehow the "types of proposed projects" will minimize exposure, is so vague that it is virtually meaningless. Does the DEIR mean to suggest that roadway or development projects will not emit diesel particulate emissions similar to other construction projects, or that construction will not occur in the vicinity of sensitive receptors such as residences, schools, hospitals, etc.?

The California Air Resources Board recognizes the importance of cancer risk from construction projects. According to an ARB analysis of a hypothetical construction project⁸, cancer risk from construction activity can exceed 10 cases in a million for an area of 26 acres surrounding a construction site.

Rather than dismiss the potential for localized health risk from diesel particulate matter, the DEIR should have performed a health risk assessment on a worst-case construction scenario to quantitatively determine the potential for significant impacts. The health risk assessment would be performed by using the U.S. EPA-approved dispersion model called AERMOD. The AERMOD model predicts the concentration of pollutants in the air, factoring in meteorological conditions such as wind speed, direction, temperature, and other factors such as proximity of sensitive receptors.

For additional modeling guidelines, the California Office of Environmental Health Hazard Assessment (OEHHA) has published guidance for the preparation of risk assessments. The OEHHA guide provides detailed modeling information as well as recommended cancer potency values that are used to determine cancer risk based on DPM concentration. The complete OEHHA guidance document is available for reference at http://www.oehha.ca.gov/air/hot_spots/HRAguidefinal.html.

The County should prepare a health risk assessment to determine potential health risk for a worst-case construction project or projects as permitted by the proposed General Plan.

XI. Health Risk From Diesel Particulate Matter is Not Mitigated to Less Than Significant (Regional Risk)

⁷ California Office of Environmental Health Hazard Assessment, http://www.oehha.ca.gov/air/hot_spots/HRAguidefinal.html

⁸ California Air Resources Board, Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Regulation for In-Use Off-Road Diesel Vehicles, April 2007, p.

The DEIR acknowledges that the health risk from regional exposure to diesel particulate matter is a potentially significant impact (DEIR, 4.7-31). As discussed above regarding localized impacts, the DEIR fails to provide a quantitative analysis of potential health risk from regional impacts. Instead, the DEIR attempts to support a less than significant determination by identifying policies and mitigation measures that claim to reduce diesel emissions to less than significant levels. But the identified policies do not meaningfully relate to diesel toxic emissions. And the mitigation measures, while directionally beneficial, are not sufficiently comprehensive to reduce impacts to less than significant.

First, the DEIR identifies General Plan policies OS-10.6 and OS-10.9. These policies help to reduce emissions in general, but are primarily focused on reducing particulate matter from dust, which is not a toxic air contaminant. These policies do not substantially reduce diesel particulate matter. Next, the DEIR lists Area Plan policies that presumably reduce diesel particulate matter. But again, the Area Plan policies are simply general air quality policies. In fact, three of the Area Plans do not address air quality at all. Other Area Plans, such as the Central Salinas Valley Area Plan, reduce emissions from sources other than diesel particulate matter (in this case, reductions are from alternative sources of energy production which would otherwise be powered primarily by natural gas power plants – not a source a diesel particulate matter).

Mitigation Measures AQ-6 and AQ-7 are identified to specifically reduce the health risk from diesel particulate matter. But each measure is limited in scope and together are not sufficient to reduce impacts to less than significant. Measure AQ-6 requires that the County enter into contracts only with contractors who use “soot traps”, ultra-low sulfur fuels, or take other actions to reduce PM10 emissions by 50 percent. First, this measure should not be limited to County contracts. It should apply to any public or private project in Monterey County, either as project-specific mitigation or as a condition of approval. Next, the term “soot traps” presumably refers to diesel particulate filters (DPF). The Measure should require the highest level of particulate reductions available. The California Air Resources Board administers a verification program for DPFs and other emissions control devices, and the highest level exhaust particulate reduction is 85 percent.⁹ At a minimum, the mitigation measure should require an 85 percent reduction in exhaust particulates, not 50 percent. However, even with these suggested improvements, the health risk from diesel particulate matter is not eliminated and remains potentially significant.

Finally, Mitigation Measure AQ-7 prohibits the location of some sensitive receptors to at least 500 feet away from high volume roadways. This measure has merit for reducing exposure to diesel particulate emissions from roadways, but it should not be limited to the identified land use types. In addition to schools, hospitals, and elderly facilities, the measure should include residential uses. In the CARB Air Quality and Land Use

⁹ DPFs that achieve 85 percent exhaust particulate reduction are classified by CARB as “Level 3” devices. For a complete list of verified Level 3 devices, see the CARB webpage at <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>

Handbook discussed on page 4.7-33 of the DEIR, residential uses are the most common sensitive receptor identified.

If you have any questions regarding these comments, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "G. Gilbert", is written over a horizontal line.

Greg Gilbert

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STATEMENT OF QUALIFICATIONS

Education

University of California, Santa Barbara; B.A., Env. Studies, 1982
Graduate and Professional Studies in Law, Planning, Emissions Modeling

Professional History

Greg Gilbert has consulted on air quality land use planning and mobile source issues and projects to private and public clients since forming Autumn Wind Associates in 2001. Previously, he was marketing director for a specialty emissions catalyst manufacturer. Between 1990 and 2000 Mr. Gilbert worked in two California air agencies, most recently as project manager in the Mobile Source Division of the Sacramento Metropolitan Air Quality Management District. While at the SMAQMD, Mr. Gilbert was responsible for implementing the District's heavy-duty vehicle low-emission incentive program that would later serve as a model for creation of the statewide Moyer Program. Air agency experience included evaluating land use-related air quality emission impacts and control strategies, developing CEQA mitigations and updating CEQA guidance, and creation of the first in-lieu air quality CEQA mitigation fee program.

Since leaving the SMAQMD he has provided consulting expertise to air agencies, provided input for revisions to the URBEMIS model, conducted research on construction practices and equipment emissions, and assisted with development of air district CEQA land use guidance documents and mitigation strategies. Mr. Gilbert has reviewed CEQA project-specific environmental documentation and provided expert written comments and testimony for public-, private-, and environmental-sector clients.