

ORIGINAL



0000091094

Arizona Corporation Commission

# Memorandum

DOCKETED

MAR 14 2001

2001 MAR 14 A 9:43

AZ CORP COMMISSION  
DOCUMENT CONTROL

|             |            |
|-------------|------------|
| DOCKETED BY | <i>nae</i> |
|-------------|------------|

**To:** Distribution List

**From:** M. Nancy Cole, Docket Administrator, Hearing Division

**Thru:** Lyn Farmer, Chief Administrative Law Judge

**Date:** 03/14/01

**Re:** IN THE MATTER OF THE APPLICATION OF SANTAN POWER PLANT FOR APPROVAL AUTHORIZING CONSTRUCTION OF A NATURAL GAS-FIRED COMBINED CYCLE GENERATING FACILITY AND SWITCHYARD IN GILBERT, ARIZONA. DOCKET # L-00000B-00-0105.

---

Docket received several letters regarding the SanTan Generating Facility. If you wish to review these letters, the originals are on file with Docket Control Center of the Arizona Corporation Commission, 1200 West Washington, Suite #108, Phoenix, Arizona 85007.

ORIGINAL

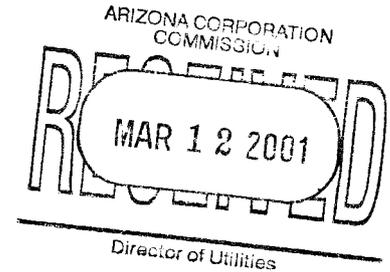
RECEIVED *John and Peggy Padilla*

2001 MAR 14 A 9:40

*1551 E. Saratoga Ct.  
Gilbert, AZ 85296*

AZ CORP COMMISSION  
DOCUMENT CONTROL

Arizona Corporation Commission  
Utilities Division  
1200 W. Washington  
Phoenix, AZ 85007  
Ref. # L-0000B-00-0105



March 7, 2001

Mr. William Mundell,

My husband and I, with our three daughters, live at 1551 E. Saratoga Ct. This is in the Silverstone Ranch community, located on the north-west corner of Val Vista and Warner Roads, behind the Fry's Plaza.

When we relocated from California, we specifically looked in Gilbert for our home. We feel we have a wonderful neighborhood and community.

The reason I am writing to you today is to express my concerns with the expansion of the S.R.P. Santan Project. Gilbert is known as a bedroom community, but if you allow S.R.P. to expand the Santan plant, Gilbert will be known as the town with the 825 megawatt power plant with three, fifteen story smoke stacks.

It will not matter how many reports show that the S.R.P. power plant will have no affect on our property values, and the pollution emitted will be within safe levels, I will, along with the many people I have spoken to, will feel that S.R.P. ruined our community.

After reading S.R.P.'s web site, it seems to me the Town of Gilbert is selling out at the expense of homeowners. Gilbert will receive all new street sweepers and hundred, thousands of dollars for Gilbert School District and for parks and equestrian trails around the plant.

It is evident that S.R.P. has the financial resources to build this plant anywhere. Yes, it would be easier for S.R.P. to expand the current power plant, but **please** do not allow this to happen at the expense of Gilbert's reputation and the quality of life for people that live in Gilbert.

Sincerely,

*Peggy Sue Padilla*

**From:** Jason Hanks <js\_hanks@yahoo.com>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/09/2001 11:09:18 AM  
**Subject:** San Tan Project

I just read all three of your bios on the web and noticed that you all have young children. My wife and I are just about to have our first. I want you to stop and think about your own children when you vote to approve this power plant. I want you to think of your kids playing in the backyard, back against the smoke stacks. Having to always wonder if they will someday come down with asthma or some other health problem and have to live with the fact it may have been the cause of the powerplant.

Remeber, if you vote to have it built you will be effecting 100's of young children just like your own.

---

Do You Yahoo!?

Get email at your own domain with Yahoo! Mail.  
<http://personal.mail.yahoo.com/>

RECEIVED

2001 MAR 14 A 9:40

AZ CORP COMMISSION  
DOCUMENT CONTROL

**From:** Jason Hanks <js\_hanks@yahoo.com>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/09/2001 10:48:51 AM  
**Subject:** SRP Santan Project

RECEIVED

2001 MAR 14 A 9:40

POWER PLANTS AND RESIDENTIAL NEIGHBORHOODS DON'T MIX!

AZ CORP COMMISSION  
DOCUMENT CONTROL

Residents of Gilbert are having to pay to large of a price so that SRP can sell energy from other plants to California. This should not happen here or anywhere in th U.S. This plant is planned to be the biggest plant EVER built in a residential neighborhood. Please do not all that you can to stop it from happening to us.

---

Do You Yahoo!?

Get email at your own domain with Yahoo! Mail.  
<http://personal.mail.yahoo.com/>

**From:** "Jon Bartlett" <jonbartlett@earthlink.net>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/08/2001 10:02:38 PM  
**Subject:** SRP San Tan Expansion

RECEIVED

2001 MAR 14 A 9:40

Chairman and Commissioners,

I urge you to vote no for the SRP power plant expansion in Gilbert Arizona.

The power plant expansion will degrade our home values and increase the air pollution. SRP has had total disregard for the voters and home owners in Gilbert, they scrapped their plans to make the stacks more aesthetically pleasing because it appeared they could manipulate the opinion polls. Gilbert is a family community -- with more children than adults ---> send a message to companies like SRP that we care about the environment where our children are raised.

AZ CORP COMMISSION  
DOCUMENT CONTROL

Please vote no!!

Jon Bartlett    Stacey Bartlett    J.T. Bartlett    Ashley Bartlett    Christopher  
Bartlett  
Gilbert Ranch  
(480) 782-6700

**From:** Olaf and Tanya Jorgenson <tojorg@qwest.net>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/08/2001 9:25:03 PM  
**Subject:** Attention: Mr. Marc Spitzer, Arizona Corporation Commission

RECEIVED  
2001 MAR 14 A 9:40

Dear Mr. Spitzer:

We're writing on behalf of the thousands of families who will be impacted by the San Tan Power Plant expansion in Gilbert. We hope dearly that you will stand up for the citizens whose health (and property values) are threatened by this project and its deisel (not natural gas!) fumes, its potential for disaster, its inappropriate placement in a heavily-populated suburban residential area. There are 1,500 homes in the affected area and we will bear the brunt of an expansion that is not necessary given the Valley's projected future power needs! Please hear the facts that the Line Sighting Commission overlooked, and please vote your conscience.

Thank you.

Respectfully,

The Jorgenson Family  
The Snyder Family  
The Sido Family

**CC:** CC.SMTP("CSnyder958@aol.com")

AZ CORP COMMISSION  
DOCUMENT CONTROL

**From:** "Olaf and Tanya Jorgenson" <tojorg@qwest.net>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/08/2001 9:23:41 PM  
**Subject:** Attention: Mr. Jim Irvin, Arizona Corporation Commission

RECEIVED

2001 MAR 14 A 9:40

Dear Mr. Irvin:

AZ CORP COMMISSION  
DOCUMENT CONTROL

We're writing on behalf of the thousands of families who will be impacted by the San Tan Power Plant expansion in Gilbert. We hope dearly that you will stand up for the citizens whose health (and property values) are threatened by this project and its deisel (not natural gas!) fumes, its potential for disaster, its inappropriate placement in a heavily-populated suburban residential area. There are 1,500 homes in the affected area and we will bear the brunt of an expansion that is not necessary given the Valley's projected future power needs! Please hear the facts that the Line Sighting Commission overlooked, and please vote your conscience.

Thank you.

Respectfully,

The Jorgenson Family  
The Snyder Family  
The Sido Family

**CC:** CC.SMTP("CSnyder958@aol.com")

**From:** "Olaf and Tanya Jorgenson" <tojorg@qwest.net>  
**Date:** 03/08/2001 9:20:18 PM  
**Subject:** Attention: Mr. Bill Mundell, Chairman, Arizona Corporation Commission

RECEIVED

2001 MAR 14 A 9:40

Dear Mr. Mundell:

We're writing on behalf of the thousands of families who will be impacted by the San Tan Power Plant expansion in Gilbert. We applaud your scrutiny and courage in the face of the Qwest rate proposal, and hope dearly that you will stand up for the citizens whose health (and property values) are threatened by this project and its deisel fumes, its potential for disaster, its inappropriate placement in a residential area. There are 1,500 residences in the affected area and we will bear the brunt of an expansion that is not necessary given the Valley's projected future power needs! Please hear the facts that the Line Sighting Commission overlooked, and vote your conscience.

AZ CORP COMMISSION  
DOCUMENT CONTROL

Thank you.

Respectfully,

The Jorgenson Family  
The Snyder Family  
The Sido Family

Gilbert, Arizona

**CC:** ACC.UTIL(mailmaster),CC.SMTP("CSnyder958@aol.com")

**From:** "mark sequeira" <msequeira@aztrib.com>  
**To:** Town Council <council@ci.gilbert.az.us>, Bob Satnan <bsatnan@aztrib.com>  
**Date:** 03/07/2001 5:19:40 PM  
**Subject:** A complete look at SanTan and East Valley appreciation

RECEIVED

2001 MAR 14 A 9:40

According to the <http://hothomes.azcentral.com> website....

It seems that 85296 and 85249 (in Gilbert) are the only zip codes in the East Valley to have lost equity in the year 2000. even 85210 which is downtown Mesa (homeless, impact of sex offenders, crime,... ) and NOT 'up-and-coming' gained 1.7% this year (and 4.7% last year)!

AZ CORP COMMISSION  
DOCUMENT CONTROL

85296: Lost 1.3% equity this year (last year gained 6.0%)

85249: Lost 1.0% (last year gained 8.9%)

Since last year's gains for 85296 and 85249 were only average (for the East Valley) I know that this loss was not a market correction as was the 4.4% loss for Queen Creek/85242 which was due to a 16.1% loss in the mail code area R004 as well as a correction for the 13.9% increase the year before.

Consider the following:

Tempe/Chandler-

85282 = +6.4% (+8.7% in 1999)

85283 = +4.8% (+7.6% in 1999)

85284 = +6.9% (+9.7% in 1999)

85226 = +6.5% (+4.5% in 1999)

E. Chandler/West Gilbert-

85202 = +6.7% (+4.4% in 1999)

85224 = +5.2% (+7.4% in 1999)

85248 = +7.9% (+5.8% in 1999)

Mesa/Gilbert west of Gilbert Rd.-

85210= +1.7% (+4.7% in 1999)

85233= +6.4% (+2.6% in 1999)

85225= +4.3% (+6.6% in 1999)

Mesa north of Gilbert-

85204= +7.4% (+6.9% in 1999)

Gilbert-

85234= +6.2% (+6.6% in 1999)

85296= -1.3% (+6.0% in 1999)

85249= -1.0% (+8.9% in 1999)

East Mesa/Queen Creek-

85236= +3.0% (+14.2% in 1999)

85206= +5.0 (+2.5% in 1999)

85208= +3.8% (+4.0% in 1999)

85212= +13.9% (0.0% in 1999)

85242= -4.4% (+13.9% in 1999)

I think I already addressed both the 85210 and 85242 issues. Where does this leave Gilbert?

Are we seeing the effects of SRP or is there another issue we should be looking at?!

Please send this around and give me feedback. I wonder if Ken Ross has seen this?

Mark Sequeira  
Gilbert

**From:** <MKrepitch@aol.com>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/06/2001 1:18:41 PM  
**Subject:** Santan Expansion

RECEIVED

2001 MAR 14 A 9:41

Commissioners,

Please do not let this 'Merchant plant' be constructed in my neighborhood. My family has a hard enough time breathing the air now.

AZ CORP COMMISSION  
DOCUMENT CONTROL

Why not allow them to install those solar collectors that they have been testing forever; and from which they collect voluntary monies from subscribers.

Sincerely,

Mike Krepitch  
Gilbert

**From:** "mark sequeira" <msequeira@aztrib.com>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/06/2001 1:00:24 PM  
**Subject:** SRP SanTan Expansion

RECEIVED

2001 MAR 14 A 9:41

Dear Sirs,

I would like to let the three commissioners know that although SRP claims that this power plant expansion is primarily East Valley use, they objected to adding a condition to the CEC application only allowing them to use the plant for new growth in the East Valley. Their exact words were something to the effect: " If we cannot sell the power generated from SanTan on the wholesale market then the plant is economically unfeasible. " The exact words are part of the final day of the Line Siting Committee hearings. I would ask all three commissioners to read that transcript and consider whether having additional power 11 days of the year is reason to allow SRP to create and sell power from this plant the other 354 days of the year.

You cannot say that creating pollution 310 days plus (85% usage) a year instead of 105 days (35% currently) is better for our air quality or asthmatics (even if the overall poundage per year will go down).

Making power 'available to Arizona first' as a requirement to allowing new plants to be built in the state is meaningless if you do not require these plants to guarantee an adequate transmission capability. The problem is TRANSMISSION not GENERATION.

Please deny the SanTan expansion.

Mark Sequeira  
Gilbert

**From:** <TIMRATHEI@aol.com>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/05/2001 9:47:54 PM  
**Subject:** Help Stop San Tan

RECEIVED

2001 MAR 14 A 9:41

Dear Members of the Arizona Corporation Commission,  
Please help the citizens of southeastern Gilbert in their battle against the proposed San Tan expansion. The negative effect this monolith will have on the health, lifestyle, and property value for myself and thousands of my neighbors will be devastating. It is astounding that SRP would propose such a project in an area already surrounded by high density large family residential housing. They of course could build it elsewhere in an outlying area where people would be able to choose whether or not to be close to it, of course they don't want to because it would cost more. This is where we are depending on you. SRP doesn't care because of profit dollars, Gilbert city leaders don't care because they only see tax dollars and wont see the smokestacks from their front door, You need to care because we elected you to put the well being of the people over that of the utility. We know that a growing community needs increasing amounts of power, but please, for the sake of thousands of families, use your influence to see that it happens in a socially responsible manner even if it does cost a little bit more. Thank you for your consideration.

Sincerely,  
Timothy P. Baker M.D.

AZ CORP COMMISSION  
DOCUMENT CONTROL

**From:** KATHLEEN S RYAN <ksryan@juno.com>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/05/2001 5:09:06 PM  
**Subject:** PROPOSED POWER PLANT IN GILBERT

RECEIVED

2001 MAR 14 A 9:41

AZ CORP COMMISSION  
DOCUMENT CONTROL

My husband and I strive to be informed consumers. We never make an investment of any appreciable size without first "checking the facts". We checked our facts very thoroughly when we purchased our new, and what we HOPED would be our final home, in Gilbert 3 years ago. We liked the neighborhood, we liked the plans for the surrounding land, and we were certain our investment would be a sound one.

Now three years later, we risk opening our front door and gazing upon ugly, gigantic, spewing stacks. Not exactly what Gilbert would want for a PR campaign! Not only is it aesthetically polluting, but it is dangerous to our health. SRP can do all the studies they want, but no one can convince us that a power plant spewing emissions is not a health hazard.

And then there is the property values. I just can't imagine anyone dreaming about a house where towering power plant stacks replace the view of the mountains and the rising white billows are not clouds, but power plant emissions. To my knowledge these features have NEVER appeared as a selling feature in a real estate ad.

Move the proposed power plant a few miles further east to an unpopulated area. Then if people choose to build around the power plant they are making an obvious and informed choice. As it is proposed now, you are trying to impose this decision on thousands of people who never had the chance of making that choice. There is plenty of land in the east valley that is not populated, but is still close enough to be economically feasible.

Ask yourselves, in all honesty, whether you would want this in your neighborhood. Would you want your family breathing power plant emissions and would you want this to be the view from your front yard. We don't, and I am certain your answer would be the same.

**From:** <ChooChooAZ@aol.com>  
**To:** ACC.UTIL(mailmaster)  
**Date:** 03/05/2001 4:34:05 PM  
**Subject:** Docket #: L-00000B-00-0105

RECEIVED

2001 MAR 14 A 9:41

Dear ACC,

I am writing to you concerning the proposed expansion of the SRP San Tan Power Plant in Gilbert. Recently, the Line Siting Committee voted to approve a Certificate of Environmental Compatability.

I am opposed to this expansion because a power plant three times its current size simply does NOT belong in a heavily residential area.

Unfortunately, the surrounding area was foolishly zoned as residential with no buffer zone. Houses have been built right up to the edge of the SRP property which is zoned for agriculture.

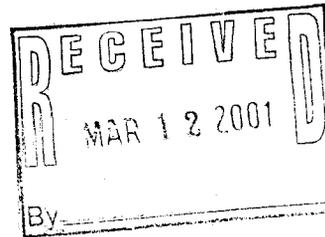
Simply put, 150 foot smokestacks and the related pollution does not belong in a densely populated area. I recommend that the existing facility be refurbished with modern equipment but at its present capacity. Therefore, please do not approve the Certificate in its present form.

Sincerely,  
Carol Haddad  
2090 East Arabian Drive  
Gilbert, AZ 85296

AZ CORP COMMISSION  
DOCUMENT CONTROL

ORIGINAL

RECEIVED



L-00003-00-10195A 10:50

SANTAN

AZ CORP COMMISSION  
DOCUMENT CONTROL

Suzanne Pager  
602 S. San Marcos Circle  
Gilbert, AZ 85296  
(480) 497-5780  
[pagersfamily@qwest.net](mailto:pagersfamily@qwest.net)  
(480)497-5780

Dear Commissioner Mundell,

I have spent several months researching health concerns regarding the San Tan expansion project. Enclosed is a paper detailing my findings and conclusions. I have enclosed footnotes and several pages of abstracts of studies and other materials referenced in the paper. This has been a very time-consuming endeavor and I would very much appreciate it if you would take the time to read the paper. It is about 3 pages long. The rest is for your ease of reference if you wish to verify my sources.

I would also like to read this paper at the hearing as I feel these health concerns are crucial in this decision. I would like to request sufficient time to read this paper at the hearing.

Thank you in advance for looking at this material.

Sincerely,

A handwritten signature in cursive script that reads "Suzanne Pager".

Suzanne Pager

## HEALTH CONCERNS REGARDING THE SAN TAN EXPANSION PROJECT

Many people assume that since the plant will burn natural gas that it will be safe to locate within a residential area. Natural gas is believed to be cleaner than diesel fuel and if choice were one between using diesel and natural gas at the same location, then natural gas would be preferred. But that is not the question.

The question that must be studied is the effects of locating a natural gas power plant in the middle of a residential area where thousands of people live, versus locating it in a remote area, at least three miles from residences. Salt River Project's air quality impact analysis shows that pollutants will be emitted way above threshold levels. While natural gas may be considered cleaner when compared with diesel, it is not devoid of pollutants. <sup>1</sup>

The air quality impact analysis has shown that the expansion will be capable of adding an additional 269.3 tons of Oxides of Nitrogen per year, 417.7 tons of carbon monoxide per year, 244.7 tons of particulate matter (PM<sub>10</sub>), 15.9 tons of sulfur dioxide per year, 104.7 tons of volatile organic compounds per year, and 24.1 tons of hazardous air pollutants per year.

Dry Low NOx burners are being installed at present on the old plant to use as NOX offsets at Kyrene, and San Tan. There will be some left over to sell to the emissions bank to sell to others wishing to build facilities in the valley with excess pollution. These dry low NOX will be installed whether or not the expansion is built. So building the expansion has no effect on reducing emissions from the old plant as SRP would lead us to believe.

Hundreds of studies have been done or are currently being done regarding the effects of air pollution and asthma. There has been a positive correlation between air pollution and respiratory and cardiopulmonary disease.<sup>2</sup> The relationship is particularly strong between those with pre-existing asthma and cardiovascular problems and air pollution, especially particulate matter. <sup>3</sup>

Many studies during the nineties studies showed that small particulates less than 2.5 micrometers in diameter were especially dangerous.<sup>4</sup> They were harmful at lower levels than coarser particles such as dust.<sup>5</sup> In fact, the EPA has proposed a new PM<sub>2.5</sub> standard based on those studies. The standard for PM<sub>2.5</sub> would be 65 microgram per cubic meter vs. the 150 micrograms per cubic meter for PM<sub>10</sub>.

These smaller particles include products of combustion, such as emissions from automobiles, power plants, etc. They are felt to be more harmful as they are smaller and can penetrate more easily into the deeper recesses of the lungs. Adverse health effects of PM<sub>2.5</sub> include increases in the number and severity of asthma attacks, increases in breathlessness of those with pulmonary disease, leading to more ER visits and hospitalization. There is much evidence that heart attacks and even premature death in people with pre-existing cardiovascular disease are triggered by moderate increases in particulate matter. Those at greatest risk are children and the elderly and those with pre-existing cardiovascular or respiratory problems. However, those with normal health may experience frequent and more serious episodes of flu, colds, and other respiratory diseases. <sup>6</sup>

Studies are currently being done to see how specific compounds in these small particulates contribute to health effects in humans. The sulfur in diesel fuel is believed to be especially harmful, although one study concluded that "the association between air pollution and daily deaths in Philadelphia is due to fine combustion particles, and not to SO(2)."<sup>7</sup> Studies on health effects of natural gas have not been done except relating to indoor gas cooking. These studies found a correlation between asthma patients and use of natural gas for cooking. One study of 500 adult asthma patients showed those who used natural gas to cook more than seven times a week had twice the number of hospital admissions as those who did not. <sup>8</sup>

The health effects of natural gas power plants have not been studied. It seems premature to locate this facility among so many people without more information as to the effects of natural gas. To say it is OK because it's better than diesel is not enough. Harmful pollutants will be emitted.

According to Dian Deevey, atmospheric scientist who has conducted research on particulate matter, "Natural gas-fired power plants are a potent source of extremely hazardous tiny particles 2.5 microns or less in diameter (PM2.5). All of the particulate matter produced by the gas fired turbines of power plants will be less than 2.5 microns in diameter. In fact, all of it will be less than 1 micron in diameter, and consist largely of organic compounds referred to as products of incomplete combustion (PICs). Some hazardous trace metals will also be released along with the PICs"

There will also be hazardous air pollutants emitted just below the threshold for modeling. The threshold is 25 tons per year. They estimated 24.1 tons per year would be emitted. This is just the expansion. SRP would not agree to any limitations on the use of the current plant as they did in Tempe. I don't believe the old plant has been modeled for hazardous air pollutants and because it is grandfathered is probably not subject to modeling. However, if both plants are operating, they will surely be capable of emitting over the threshold of hazardous air pollutants. These pollutants include hazardous organic compounds and trace metals. Some of these are formaldehyde, benzene, hexane, toluene, naphthalene, mercury, arsenic, and polycyclic aromatic hydrocarbons, to name but a few.

Another concern is the ammonia that will be used as a catalyst to reduce nitrous oxide emissions. If temperature is not kept within a certain range, some of this ammonia will escape in the stack. This is called ammonia slip and is a concern where a catalytic reduction system is used to remove nitrous oxide as is proposed as San Tan. Also, large amounts of ammonia will be stored on the facility. A leak could force thousands of evacuations in the surrounding neighborhood.

During startups, the concentrations of pollutants is higher. SRP has estimated there will be an approximate 458 start ups per year. In a cold start, for instance 760 pounds of CO will be emitted in an hour. Warm and hot starts would be slightly less, but both emit over 700 pounds in one hour. In one hour approximately 145 lbs of NOX, 93 lbs of VOC (which include Hazardous air pollutants), 18 lbs of PMS and 1.2 lbs. of sulfur dioxide. The amount of carbon released at start ups is especially great. There has been a positive correlation between CO and cardiopulmonary problems in children.<sup>9</sup> Carbon monoxide reduces the ability of the blood to bring oxygen to body cells and tissues. It is especially hazardous to people who have heart or circulatory problems and persons with damaged lungs.<sup>10</sup>

SRP has said that the height of the stacks would allow the pollutants to disperse. However, at their first open house, an air quality expert from Danes and Moore admitted that some particles would fall to the ground within a five-kilometer (or a little over three mile) radius.

The current plant has always been used as a peaking plant, mostly in the summer. From 1993-1999 is averaged about 14 to 15 percent usage a year. Until electric prices rose in 2000 it was not cost effective to use it more. It was not built as a base load plant. The proposed expansion project is intended to be used as a base load plant. SRP has stated that it would operate year round, 24 hours a day. With down time for maintenance, they estimate it would run at about 80% capacity. Requests for limited wintertime usage have been rebuffed by SRP, who have refused any compromise on both the size and operation of either the old plant or the new expansion.

That we would go from a mostly summertime plant to one used all winter long is especially disturbing due to two considerations. One, winter is the worst season for asthmatics in the valley. Two, winter is the time when air is more stagnant and pollutants can't escape due to frequent inversion caps.

According to a modeling specialist with the US EPA, a stationary source with a plume reacts differently to air inversions than mobile sources. The plume will hit the inversion cap and bounce back down to the ground in higher concentrations near the plant. If the effects of inversion are not studied, the amount of pollution near the plant will probably be underestimated. The smokestack would not be high enough to get the pollution past the inversion cap.

According to SRP's Dames and Moore Air Quality Report Wind Rose Chart, air is calm 18% of the time. 0 mph wind speed data is thrown out in dispersion modeling because "0" can't be used as a multiplier, so modeling tends to underestimate pollution where the air is calm a lot. An overwhelming majority of days had wind speeds 6 mph or under. (Incidentally wind comes almost equally from the West, East, and East

South East, so pollution will not be blown out of town as has been suggested by SRP). A study in Seattle led to the conclusion that "Increased air stagnation was shown to be a surrogate for accumulation of the products of incomplete combustion, including carbon monoxide and fine particulate levels of organic and elemental carbon, and was more strongly associated with asthma aggravation than any one of the measured pollutants."<sup>11</sup>

Inversions are studied using upper air data. Up until a few months ago, the only upper air data available in Arizona was from Tucson. Tucson upper air data was used in SRP's air analysis. To put this plant among so many people without local data is not right. Even this last winter was not typical. It was wetter and cooler than normal. Inversions didn't seem to be as much of a problem. Data and studies on inversions should be studied for about three years before this plant is permitted.

After inversions are studied, a comprehensive health effects study using this information should be conducted over a two to three year period to study effects on health, especially on those with cardio respiratory problem and young children with developing lungs. The stakes are too high in this case not to do this. Even if this won't affect healthy adults, we need to be concerned about our children and susceptible populations.

Another aspect to be considered is emissions caused by construction. Power plants usually take about 2 years to build. Many pieces of equipment will be hauled in by truck or train using diesel fuel. Massive amounts of cement will be needed and cement mixers will be coming and going. There is also will be fugitive dust involved in addition to and also as a result the heavy equipment. A new 16" gas line being installed to bring gas to the plant has been proposed to go next to the railroad track which also mainly runs through residential areas in Gilbert. Even before the plant is built the pollution will begin.

It is premature to build this plant in a residential area. It is the only industry in the area. There is no buffer zone. Subdivisions are adjacent to or across the street from the SRP property and the closest is within 850 feet of the actual plant itself. More data gathering on inversions in the valley needs to be done, three years at least, as winters vary. Then more studies on health effects need to be conducted over a three year period of time using data from inversions and considering start up concentrations. Particularly studies need to be done on those with cardiopulmonary diseases.

SRP's air quality review compared the old plant being used at 55% capacity versus the new one being used at the same capacity. This does not reflect reality. They would agree to no limit on old plant usage. The old plant has been used at about an average of 17% capacity over the last 9 years for which data is available. The new plant is planned to be used at at least 80% capacity. Background information and details of their analysis were not provide, even when intervenors asked for them. A greatly increased wintertime usage was not addressed. Summer and wintertime increases were not considered separately. Increased concentrations during inversions and start-ups were not addressed.

Number crunching alone will not be sufficient when our health and our children's health are at stake. We are not masochists who want to be human guinea pigs subject to SRP's untested belief that this will not harm us. We do not simply want to move and let someone else deal with the problem. My son who is asthmatic said he would rather have trouble breathing than move away from his friends of twelve years his first year of high school. We should not have to make choices like this. The old peaking plant was here before we were. But in regards to the expansion, we were here long before it.

Human health is not to be toyed with because it is more convenient and cost efficient to build the plant here than elsewhere. If the cost to locate out of town were spread among customers it would cost less than \$5 a year per customer. It's not worth it to build it where so many people can be harmed. There are currently undeveloped areas where transmission lines can be sited. In fact a major line runs south of the plant and could be extended in undeveloped areas. It is not necessary and a great risk for our health sensitive population to build this plant at the Warner and Val Vista location in Gilbert.

## Footnotes

### 1. Semi-volatile and particulate emissions from the combustion of alternative diesel fuels.

Sidhu S, Graham J, Striebich R

Environmental Science and Engineering, University of Dayton Research Institute, OH 45469-0132, USA.

sidhu@udri.udayton.edu

### 2. Effects of ambient air pollution on nonelderly asthma hospital admissions in Seattle, Washington, 1987-1994.

Sheppard L; Levy D; Norris G; Larson TV; Koenig JQ

Department of Biostatistics, University of Washington, Seattle 98195-7232, USA.

Epidemiology 1999 Jan;10(1):23-30.

#### Airborne particles are a risk factor for hospital admissions for heart and lung disease.

Zanobetti A, Schwartz J, Dockery DW

Environmental Epidemiology Program, Department of Environmental Health, Harvard School of Public Health, Boston,

Massachusetts 02115, USA. [azanob@sparc6a.harvard.edu](mailto:azanob@sparc6a.harvard.edu)

### 3. Are there sensitive subgroups for the effects of airborne particles?

Zanobetti A, Schwartz J, Gold D

Environmental Epidemiology Program, Department of Environmental Health, Harvard School of Public Health, Boston,

Massachusetts 02115, USA. [azanob@sparc6a.harvard.edu](mailto:azanob@sparc6a.harvard.edu)

### 4. An association between fine particles and asthma emergency department visits for children in Seattle.

Norris G; YoungPong SN; Koenig JQ; Larson TV; Sheppard L; Stout JW

Department of Civil and Environmental Engineering, University of Washington, Seattle, Washington 98195-7234, USA.

Environ Health Perspect 1999 Jun;107(6):489-93.

### Fine particulate air pollution and mortality in 20 U.S. cities, 1987-1994.

Samet JM; Dominici F; Curriero FC; Coursac I; Zeger SL

Department of Epidemiology, School of Hygiene and Public Health,

Johns Hopkins University, Baltimore, MD 21205, USA. [jsamet@jhsph.edu](mailto:jsamet@jhsph.edu)

N Engl J Med 2000 Dec 14;343(24):1742-9

### 5. Fine particles are more strongly associated than coarse particles with acute respiratory health effects in schoolchildren.

Schwartz J, Neas LM

Department of Environmental Health, Harvard School of Public Health, Boston, MA 02115, USA.

### 6. <http://www.epa.gov/Region7/program/artd/air/quality/pmhealth.htm>

### 7. Daily deaths are associated with combustion particles rather than SO(2) in Philadelphia.

Schwartz J

Environmental Epidemiology Program, Harvard School of Public Health, 665 Huntington Ave, Boston

MA 02115, USA. [jschwartz@hsph.harvard.edu](mailto:jschwartz@hsph.harvard.edu)

### 8. Gas Stoves May Increase Asthma Attacks

Environmental Health Perspectives Vol. 108, No. 1, Jan. 2000

### 9. Effects of ambient air pollution on nonelderly asthma hospital admissions in Seattle, Washington, 1987-1994.

Sheppard L; Levy D; Norris G; Larson TV; Koenig JQ

Department of Biostatistics, University of Washington, Seattle 98195-7232, USA.

### 10. <http://www.epa.gov/Region9/air/permit/cap.htm>

### 11. Asthma aggravation, combustion, and stagnant air.

Norris G; Larson T; Koenig J; Claiborn C; Sheppard L; Finn D

University of Washington, Seattle, WA 98195, USA.

Thorax 2000 Jun;55(6):466-70.

**Abstracts and Other Referenced Material (7 pages)**  
**Air Quality and Health Concerns Regarding the San Tan Expansion Project**  
National Library of Medicine

**TITLE:** Fine particulate air pollution and mortality in 20 U.S. cities, 1987-1994.

**AUTHORS:** Samet JM; Dominici F; Curriero FC; Coursac I; Zeger SL

**AUTHOR AFFILIATION:** Department of Epidemiology, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, MD 21205, USA. jsamet@jhsp.h.edu

**SOURCE:** N Engl J Med 2000 Dec 14;343(24):1742-9.

**CITATION IDS:** PMID: 11114312 UI: 20550366

**COMMENT IN:** N Engl J Med. 2000 Dec 14;343(24):1798-9

**ABSTRACT:** **BACKGROUND:** Air pollution in cities has been linked to increased rates of mortality and morbidity in developed and developing countries. Although these findings have helped lead to a tightening of air-quality standards, their validity with respect to public health has been questioned. **METHODS:** We assessed the effects of five major outdoor-air pollutants on daily mortality rates in 20 of the largest cities and metropolitan areas in the United States from 1987 to 1994. The pollutants were particulate matter that is less than 10 microm in aerodynamic diameter (PM10), ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide. We used a two-stage analytic approach that pooled data from multiple locations. **RESULTS:** After taking into account potential confounding by other pollutants, we found consistent evidence that the level of PM10 is associated with the rate of death from all causes and from cardiovascular and respiratory illnesses. The estimated increase in the relative rate of death from all causes was 0.51 percent (95 percent posterior interval, 0.07 to 0.93 percent) for each increase in the PM10 level of 10 microg per cubic meter. The estimated increase in the relative rate of death from cardiovascular and respiratory causes was 0.68 percent (95 percent posterior interval, 0.20 to 1.16 percent) for each increase in the PM10 level of 10 microg per cubic meter. There was weaker evidence that increases in ozone levels increased the relative rates of death during the summer, when ozone levels are highest, but not during the winter. Levels of the other pollutants were not significantly related to the mortality rate. **CONCLUSIONS:** There is consistent evidence that the levels of fine particulate matter in the air are associated with the risk of death from all causes and from cardiovascular and respiratory illnesses. These findings strengthen the rationale for controlling the levels of respirable particles in outdoor air.

---

National Library of Medicine

**TITLE:** An association between fine particles and asthma emergency department visits for children in Seattle.

**AUTHORS:** Norris G; YoungPong SN; Koenig JQ; Larson TV; Sheppard L; Stout JW

**AUTHOR AFFILIATION:** Department of Civil and Environmental Engineering, University of Washington, Seattle, Washington 98195-7234, USA.

**SOURCE:** Environ Health Perspect 1999 Jun;107(6):489-93.

**CITATION IDS:** PMID: 10339450 UI: 99272539

**ABSTRACT:** Asthma is the most common chronic illness of childhood and its prevalence is increasing, causing much concern for identification of risk factors such as air pollution. We previously conducted a study showing a relationship between asthma visits in all persons < 65 years of age to emergency departments (EDs) and air pollution in Seattle, Washington. In that study the most frequent zip codes of the visits were in the inner city. The Seattle-King County Department of Public Health (Seattle, WA) subsequently published a report which showed that the hospitalization rate for children in the inner city was over 600/100,000, whereas it was < 100/100,000 for children living in the suburbs. Therefore, we conducted the present study to evaluate whether asthma visits to hospital emergency departments in the inner city of Seattle were associated with outdoor air pollution levels. ED visits to six hospitals for asthma and daily air pollution data were obtained for 15 months during 1995 and 1996. The association between air pollution and childhood ED visits for asthma from the inner city area with high asthma hospitalization rates were compared with those from lower hospital utilization areas. Daily ED counts were regressed against fine particulate matter (PM), carbon monoxide (CO), sulfur dioxide, and nitrogen dioxide using a semiparametric Poisson regression model. Significant associations were found between ED visits for asthma in children and fine PM and CO. A change of 11 microg/m<sup>3</sup> in fine PM was associated with a relative rate of 1.15 [95% confidence interval (CI), 1.08-1.23]. There was no stronger

association between ED visits for asthma and air pollution in the higher hospital utilization area than in the lower utilization area. These findings were seen when estimated PM<sub>2.5</sub> concentrations were below the newly adopted annual National Ambient Air Quality Standard of 15 microg/m<sup>3</sup>.

---

National Library of Medicine

**TITLE:** **Effects of ambient air pollution on nonelderly asthma hospital admissions in Seattle, Washington, 1987-1994.**

**AUTHORS:** Sheppard L; Levy D; Norris G; Larson TV; Koenig JQ

**AUTHOR AFFILIATION:** Department of Biostatistics, University of Washington, Seattle 98195-7232, USA.

**SOURCE:** Epidemiology 1999 Jan;10(1):23-30.

**CITATION IDS:** PMID: 9888276 UI: 99103351

**COMMENT IN:** Epidemiology. 1999 Jan;10(1):1-4  
Epidemiology. 2000 May;11(3):367-8

**ABSTRACT:** As part of the Clean Air Act, Congress has directed EPA to set air quality standards to protect sensitive population groups from air pollutants in the ambient environment. People with asthma represent one such group. We undertook a study of the relation between measured ambient air pollutants in Seattle and nonelderly hospital admissions with a principal diagnosis of asthma. We regressed daily hospital admissions to local hospitals for area residents from 1987 through 1994 on particulate matter less than 10 and 2.5 microm in aerodynamic diameter (PM<sub>10</sub> and PM<sub>2.5</sub>, respectively); coarse particulate mass; sulfur dioxide (SO<sub>2</sub>); ozone (O<sub>3</sub>); and carbon monoxide (CO) in a Poisson regression model with control for time trends, seasonal variations, and temperature-related weather effects. With the exception of seasonally monitored O<sub>3</sub>, we supplemented incomplete pollutant measures in a multiple imputation model to create a complete time series of exposure measures. We found an estimated 4-5% increase in the rate of asthma hospital admissions associated with an interquartile range change in PM (19 microg/m<sup>3</sup> PM<sub>10</sub>, 11.8 microg/m<sup>3</sup> PM<sub>2.5</sub>, and 9.3 microg/m<sup>3</sup> coarse particulate mass) lagged 1 day; relative rates were as follows: for PM<sub>10</sub>, 1.05 [95% confidence interval (CI) = 1.02-1.08]; for PM<sub>2.5</sub>, 1.04 (95% CI = 1.02-1.07); and for coarse particulate mass, 1.04 (95% CI = 1.01-1.07). In single-pollutant models we also found that a 6% increase in the rate of admission was associated with an interquartile range change in CO (interquartile range, 924 parts per billion; 95% CI = 1.03-1.09) at a lag of 3 days and an interquartile range change in O<sub>3</sub> (interquartile range, 20 parts per billion; 95% CI = 1.02-1.11) at a lag of 2 days. We did not observe an association for SO<sub>2</sub>. We found PM and CO to be jointly associated with asthma admissions. We estimated the highest increase in risk in the spring and fall seasons.

---

National Library of Medicine

**TITLE:** **Asthma aggravation, combustion, and stagnant air.**

**AUTHORS:** Norris G; Larson T; Koenig J; Claiborn C; Sheppard L; Finn D

**AUTHOR AFFILIATION:** University of Washington, Seattle, WA 98195, USA.

**SOURCE:** Thorax 2000 Jun;55(6):466-70.

**CITATION IDS:** PMID: 10817794 UI: 20278253

**ABSTRACT:** **BACKGROUND:** The relationship between current concentrations of ambient air pollution and adverse health effects is controversial. We report a meteorological index of air stagnation that is associated with daily visits to the emergency department for asthma in two urban areas. **METHODS:** Data on daily values of a stagnation persistence index and visits to the emergency department for asthma were collected for approximately two years in Spokane, Washington, USA and for 15 months in Seattle, Washington, USA. The stagnation persistence index represents the number of hours during the 24 hour day when surface wind speeds are less than the annual hourly median value, an index readily available for most urban areas. Associations between the daily stagnation persistence index and daily emergency department visits for asthma were tested using a generalised additive Poisson regression model. A factor analysis of particulate matter (PM<sub>2.5</sub>) composition was performed to identify the pollutants associated with increased asthma visits. **RESULTS:** The relative rate of the association between a visit to the emergency department for asthma and the stagnation persistence index

was 1.12 (95% CI 1.05 to 1.19) in Spokane and 1.21 (95% CI 1.09 to 1.35) in Seattle for an increase of 11 and 10 hours, respectively, of low wind speed in a given day. The stagnation persistence index was only correlated with one set of factor loadings; that cluster included the stagnation persistence index, carbon monoxide, and organic/elemental carbon. CONCLUSION: Increased air stagnation was shown to be a surrogate for accumulation of the products of incomplete combustion, including carbon monoxide and fine particulate levels of organic and elemental carbon, and was more strongly associated with asthma aggravation than any one of the measured pollutants.

*U.S. EPA Region 9  
Common Air Pollutants (Criteria Air Pollutants)*

| <b>Name</b>  | <b>Source</b>   | <b>Health Effects</b>   | <b>Environmental Effects</b>   | <b>Property Damage</b>   |
|--|---|---|--|--|
| <u>Ozone*</u><br><br>(ground-level ozone is the principal component of smog) | Chemical reaction of pollutants (VOCs and NOx) with sunlight  | Breathing problems, reduced lung function, asthma, irritates eyes, stuffy nose, reduced resistance to colds and other infections, may speed up aging of lung tissue   | Ozone can damage plants and trees; smog can cause reduced visibility   | Damages rubber, fabrics, etc.  |
| <u>VOCs*</u><br><br>(volatile organic compounds); smog-formers               | VOCs are released from burning fuel (gasoline, oil, wood, coal, natural gas, etc.), solvents, paints, glues, and other products used at work or at home. Cars are an important source of VOCs. VOCs include chemicals such as benzene, toluene, methylene chloride and methyl chloroform. | In addition to causing ozone (smog), many VOCs are toxic, and can cause serious health problems such as cancer and other effects.   | In addition to ozone (smog) effects, some VOCs such as formaldehyde and ethylene may harm plants                                       |  |
| <u>Nitrogen Dioxide*</u><br><br>(one of the NOx*) smog-forming chemical      | Burning of gasoline, natural gas, coal, oil, etc. Cars are an important source of NO2   | Lung damage, illnesses of breathing passages and lungs (respiratory system)   | Nitrogen dioxide is an ingredient of acid rain (acid aerosols), which can damage trees and lakes. Acid aerosols can reduce visibility. | Acid aerosols can eat away stone used on buildings, statues, monuments, etc.                                       |
| <u>Carbon Monoxide (CO)*</u>   | Burning of gasoline, wood, natural gas, coal, oil, etc.   | Reduces ability of blood to bring oxygen to body cells and tissues. Carbon monoxide may be particularly hazardous to people who have heart or circulatory (blood vessel) problems and people who have damaged lungs or breathing passages |  |  |
| <u>Particulate Matter (PM-10)*</u><br><br>dust, smoke, and soot              | Burning of wood, diesel and other fuels; industrial plants; agriculture (plowing, burning off fields); unpaved roads  | Nose and throat irritation, lung damage, bronchitis, early death  | Particulates are the main source of haze that reduces visibility   | Ashes, soot, smoke, and dust can dirty and discolor structures and other property, including clothes and furniture |

|                        |   |   |   |  |
|------------------------|---|---|---|--|
| <u>Sulfur Dioxide*</u> | Burning of coal and oil, especially high sulfur coal from the eastern United States; industrial processes (paper, metals)   | Breathing problems, may cause permanent damage to lungs   | SO2 is an ingredient in acid rain (acid aerosols), which can damage trees and lakes... Acid aerosols can also reduce visibility | Acid aerosols can eat away stone used in buildings, statues, monuments, etc. |
| <b>Lead</b>            | Leaded gasoline (being phased out), paint (house, cars), smelters (metal refineries; manufacture of lead storage batteries) | Brain and other nervous system damage. Children are at special risk. Some lead-containing chemicals cause cancer in animals. Lead causes digestive and other health problems. | Lead can harm wildlife.   |  |

For more information, click [Plain English Guide to the Clean Air Act](http://www.epa.gov/region09/air/permit/cap.htm) \* Updated: October 29, 1998  
 URL: <http://www.epa.gov/region09/air/permit/cap.htm>

United States Environmental Protection Agency  
 Office of Air & Radiation  
 Office of Air Quality Planning & Standards  
 FACT SHEET

July 17, 1997

**HEALTH AND ENVIRONMENTAL EFFECTS OF PARTICULATE MATTER**

**Why are We Concerned About Particulate Matter?**

- Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air.
  - Coarse particles (larger than 2.5 micrometers) come from a variety of sources including windblown dust and grinding operations.
  - Fine particles (less than 2.5 micrometers) often come from fuel combustion, power plants, and diesel buses and trucks.
- These fine particles are so small that several thousand of them could fit on the period at the end of this sentence.
  - They are of health concern because they easily reach the deepest recesses of the lungs.
- Batteries of scientific studies have linked particulate matter, especially fine particles (alone or in combination with other air pollutants), with a series of significant health problems, including:
  - Premature death;
  - Respiratory related hospital admissions and emergency room visits;
  - Aggravated asthma;
  - Acute respiratory symptoms, including aggravated coughing and difficult or painful breathing;
  - Chronic bronchitis;
  - Decreased lung function that can be experienced as shortness of breath; and
  - Work and school absences.

**Who is Most at Risk from Exposure to Fine Particles?**

- **The Elderly:**
  - Studies estimate that tens of thousands of elderly people die prematurely each year from exposure to ambient levels of fine particles.
  - Studies also indicate that exposure to fine particles is associated with thousands of hospital admissions each year. Many of these hospital admissions are elderly people suffering from lung or heart disease.
- **Individuals with Preexisting Heart or Lung Disease:**
  - Breathing fine particles can also adversely affect individuals with heart disease, emphysema, and chronic bronchitis by causing additional medical treatment.
  - Inhaling fine particulate matter has been attributed to increased hospital admissions, emergency room visits and premature death among sensitive populations.
- **Children:**
  - The average adult breathes 13,000 liters of air per day; children breathe 50 percent more air per pound of body weight than adults.
  - Because children's respiratory systems are still developing, they are more susceptible to environmental threats than healthy adults

- Exposure to fine particles is associated with increased frequency of childhood illnesses, which are of concern both in the short run, and for the future development of healthy lungs in the affected children.
- Fine particles are also associated with increased respiratory symptoms and reduced lung function in children, including symptoms such as aggravated coughing and difficulty or pain in breathing. These can result in school absences and limitations in normal childhood activities.
- Asthmatics and Asthmatic Children:
  - More and more people are being diagnosed with asthma every year. Fourteen Americans die every day from asthma, a rate three times greater than just 20 years ago. Children make up 25 percent of the population, but comprise 40 percent of all asthma cases.
  - Breathing fine particles, alone or in combination with other pollutants, can aggravate asthma, causing greater use of medication and resulting in more medical treatment and hospital visits.

#### **How do Particulate Matter and Fine Particles Effect the Environment?**

- The same fine particles linked to serious health effects are also a major cause of visibility impairment in many parts of the U.S.
- In many parts of the U.S. the visual range has been reduced 70% from natural conditions. In the east, the current range is only 14-24 miles vs. a natural visibility of 90 miles. In the west, the current range is 33-90 miles vs. a natural visibility of 140 miles.
- Fine particles can remain suspended in the air and travel long distances. For example, a puff of exhaust from a diesel truck in Los Angeles can end up over the Grand Canyon, where one-third of the haze comes from Southern California. Emissions from a Los Angeles oil refinery can form particles that in a few days will effect visibility in the Rocky Mountain National Park. Twenty percent of the problem on dirtiest days in that Park is attributed to Los Angeles-generated smog.
- Airborne particles can also cause soiling and damage to materials.

#### **What Improvements Would Result from EPA's New Standards?**

- EPA's new standards will provide increased health protection from the following effects:
  - About 15,000 lives each year will be saved, especially among the elderly and those with existing heart and lung diseases.
  - Reduced risk of hospital admissions by thousands each year, and fewer emergency room visits, especially in the elderly and those with existing heart and lung diseases.
  - Reduced risk of symptoms associated with chronic bronchitis, tens of thousands fewer cases each year.
  - Reduced risk of respiratory symptoms in children, hundreds of thousands fewer incidences each year of symptoms such as aggravated coughing and difficult or painful breathing.
  - Reduced risk of aggravation of asthma, hundreds of thousands fewer incidences each year, in children and adults with asthma.
  - Reduced risks of susceptibility to childhood illnesses.
- Improved visibility over broad regions in the east and urban areas:
  - The Clean Air Act placed special emphasis on preserving visibility in certain national parks and wilderness areas. In response, EPA is developing a "regional haze" program intended to ensure all parts of the country make continued progress toward the national visibility goal of "no manmade impairment."
  - New standards that EPA has promulgated, together with the "regional haze" program under development, will protect against visibility impairment, soiling and material damage effects, and will further reduce acid rain.

#### **Background: What is Particulate Matter and What are "Fine" Particles?**

- Particulate matter originates from a variety of sources, including diesel trucks, power plants, wood stoves and industrial processes. The chemical and physical composition of these various particles vary widely. While individual particles cannot be seen with the naked eye, collectively they can appear as black soot, dust clouds, or grey hazes.
- Those particles that are less than 2.5 micrometers in diameter are known as "fine" particles; those larger than 2.5 micrometers are known as "coarse" particles. Fine particles result from fuel combustion (from motor vehicles, power generation, industrial facilities), residential fireplaces and wood stoves. Fine particles can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. Coarse particles are generally emitted from sources such as vehicles traveling on unpaved roads, materials handling, and crushing and grinding operations, and windblown dust.
- EPA is also maintaining a national air quality standard focused on small particles less than 10 micrometers in diameter (known as "PM<sub>10</sub>") to protect against coarse particle effects. Ten micrometers are about one-seventh the diameter of a human hair.
- Before 1987, EPA's standards regulated larger particles (so called "total suspended particulates"), including those larger than 10 micrometers. By 1987, research had shown that the particles of greatest health concern were those equal to or

less than 10 micrometers that can penetrate into sensitive regions of the respiratory tract. At that time EPA and states took action to monitor and regulate particulate matter 10 micrometers and smaller.

- In the years since the previous standard was enacted, hundreds of significant new scientific studies have been published on the health effects of particulate matter. Recent health effects studies suggest those adverse public health effects, such as premature deaths and increased morbidity in children and other sensitive populations, have been associated with exposure to particle levels well below those allowed by the current standard.

## **Are there sensitive subgroups for the effects of airborne particles?**

**Zanobetti A, Schwartz J, Gold D**

Environmental Epidemiology Program, Department of Environmental Health, Harvard School of Public Health, Boston, Massachusetts 02115, USA. [azanob@sparc6a.harvard.edu](mailto:azanob@sparc6a.harvard.edu)

Recent studies have shown that particulate air pollution is a risk factor for hospitalization for heart and lung disease; however, little is known about what subpopulations are most sensitive to this pollutant. We analyzed Medicare hospital admissions for heart disease, chronic obstructive pulmonary disorders (COPD) and pneumonia in Chicago, Cook County, Illinois, between 1985 and 1994. We examined whether previous admissions or secondary diagnoses for selected conditions predisposed persons to having a greater risk from air pollution. We also considered effect modification by age, sex, and race. We found that the air-pollution-associated increase in hospital admissions for cardiovascular diseases was almost doubled in subjects with concurrent respiratory infections. The risk was also increased by a previous admission for conduction disorders. For COPD and pneumonia admissions, diagnosis of conduction disorders or dysrhythmias increased the risk of particulate matter < 10 microm in aerodynamic diameter (PM(10))-associated admissions. Persons with asthma had twice the risk of a PM(10)-associated pneumonia admission and persons with heart failure had twice the risk of PM(10)-induced COPD admissions. The PM(10) effect did not vary by sex, age, and race. These results suggest that patients with acute respiratory infections or defects in the electrical control of the heart are a risk group for particulate matter effects.

PMID: 11017888

## **Airborne particles are a risk factor for hospital admissions for heart and lung disease.**

**Zanobetti A, Schwartz J, Dockery DW**

Environmental Epidemiology Program, Department of Environmental Health, Harvard School of Public Health, Boston, Massachusetts 02115, USA. [azanob@sparc6a.harvard.edu](mailto:azanob@sparc6a.harvard.edu)

We examined the association between particulate matter [less than/equal to] 10 microm; (PM(10)) and hospital admission for heart and lung disease in ten U.S. cities. Our three goals were to determine whether there was an association, to estimate how the association was distributed across various lags between exposure and response, and to examine socioeconomic factors and copollutants as effect modifiers and confounders. We fit a Poisson regression model in each city to allow for city-specific differences and then combined the city-specific results. We examined potential confounding by a meta-regression of the city-specific results. Using a model that considered simultaneously the effects of PM(10) up to lags of 5 days, we found a 2.5% [95% confidence interval (CI), 1.8-3.3] increase in chronic obstructive pulmonary disease, a 1.95% (CI, 1.5-2.4) increase in pneumonia, and a 1.27% increase (CI, 1-1.5) in CVD for a 10 microg/m<sup>3</sup> increase in PM(10). We found similar effect estimates using the mean of PM(10) on the same and previous day, but lower estimates using only PM(10) for a single day. When using only days with PM(10) < 50 mg/m<sup>3</sup>, the effect size increased by [greater/equal to] 20% for all three outcomes. These effects are not modified by poverty rates or minority status. The results were stable when controlling for confounding by sulfur dioxide, ozone, and carbon monoxide. These results are consistent with previous epidemiology and recent mechanistic studies in animals and humans.

Comment in: *Environ Health Perspect.* 2000 Nov;108(11):A520-1 PMID: 11102299

---

## **Fine particles are more strongly associated than coarse particles with acute respiratory health effects in schoolchildren.**

**Schwartz J, Neas LM**

Department of Environmental Health, Harvard School of Public Health, Boston, MA 02115, USA.

Numerous studies have reported associations between airborne particles and a range of respiratory outcomes from symptoms to mortality. Current attention has been focused on the characteristics of these particles responsible for the adverse health effects. We have reanalyzed three recent longitudinal diary studies to examine the relative contributions of fine and coarse particles on respiratory symptoms and peak expiratory flow in schoolchildren. In the Harvard Six Cities Diary Study, lower respiratory

symptoms in a two-pollutant model were associated with an interquartile range increment in fine particles [(for 15 microg/m<sup>3</sup> particulate matter (PM) <2.5 microm in aerodynamic diameter (PM<sub>2.5</sub>), odds ratio = 1.29, 95% confidence limits (CL) = 1.06, 1.57] but not coarse particles (for 8 microg/m<sup>3</sup> PM<sub>2.5-10</sub>, odds ratio = 1.05, 95% CL = 0.90, 1.23). In Uniontown, PA, we found that peak flow was associated with fine particles (for 15 microg/m<sup>3</sup> PM<sub>2.1</sub>, peak flow = -0.91 liters/minute, 95% CL = -0.14, -1.68), especially fine sulfate particles, but not with coarse particles (for 15 microg/m<sup>3</sup> PM<sub>2.1-10</sub>, +1.04 liters/minute, 95% CL = -1.32, +3.40). We found similar results for an equivalent children's cohort in State College, PA. We conclude that fine particles, especially fine sulfate particles, have much stronger acute respiratory effects than coarse particles.

Comment in: *Epidemiology*. 2000 Jan;11(1):2-4

PMID: 10615836

## **Daily deaths are associated with combustion particles rather than SO<sub>2</sub> in Philadelphia.**

**Schwartz J**

Environmental Epidemiology Program, Harvard School of Public Health, 665 Huntington Ave, Boston MA 02115, USA.

jschwartz@hsph.harvard.edu

**OBJECTIVES:** To assess whether the association between SO<sub>2</sub> and daily deaths in Philadelphia during the years 1974-88 is due to its correlation with airborne particles, and vice versa. **METHODS:** There is a significant variation in the relation between total suspended particulate (TSP) and SO<sub>2</sub> in Philadelphia by year and season. Firstly, 30 separate regressions were fitted for each pollutant in the warm and cold season of each year. These regressions controlled for weather, long term temporal patterns, and day of the week. Then a meta-regression was performed to find whether the effect of SO<sub>2</sub> was due to TSP, or vice versa. **RESULTS:** Controlling for TSP, there was no significant association between SO<sub>2</sub> and daily deaths. By contrast, in periods when TSP was less correlated with SO<sub>2</sub>, its association with daily deaths was higher. However, all of the association between TSP and daily deaths was explained by its correlation with extinction coefficient, a measurement of the scattering of light by fine particles, which has been shown to be highly correlated with fine combustion particles in Philadelphia. **CONCLUSIONS:** The association between air pollution and daily deaths in Philadelphia is due to fine combustion particles, and not to SO<sub>2</sub>.

PMID: 10984342

## **Semi-volatile and particulate emissions from the combustion of alternative diesel fuels.**

**Sidhu S, Graham J, Striebich R**

Environmental Science and Engineering, University of Dayton Research Institute, OH 45469-0132, USA.

sidhu@udri.udayton.edu

[Medline record in process]

Motor vehicle emissions are a major anthropogenic source of air pollution and contribute to the deterioration of urban air quality. In this paper, we report results of a laboratory investigation of particle formation from four different alternative diesel fuels, namely, compressed natural gas (CNG), dimethyl ether (DME), biodiesel, and diesel, under fuel-rich conditions in the temperature range of 800-1200 degrees C at pressures of approximately 24 atm. A single pulse shock tube was used to simulate compression ignition (CI) combustion conditions. Gaseous fuels (CNG and DME) were exposed premixed in air while liquid fuels (diesel and biodiesel) were injected using a high-pressure liquid injector. The results of surface analysis using a scanning electron microscope showed that the particles formed from combustion of all four of the above-mentioned fuels had a mean diameter less than 0.1 microm. From results of gravimetric analysis and fuel injection size it was found that under the test conditions described above the relative particulate yields from CNG, DME, biodiesel, and diesel were 0.30%, 0.026%, 0.52%, and 0.51%, respectively. Chemical analysis of particles showed that DME combustion particles had the highest soluble organic fraction (SOF) at 71%, followed by biodiesel (66%), CNG (38%) and diesel (20%). This illustrates that in case of both gaseous and liquid fuels, oxygenated fuels have a higher SOF than non-oxygenated fuels.

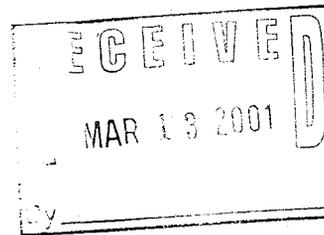
PMID: 11219694

---

ORIGINAL

March 2, 2001

A.L. & S.M. CHESTER  
1462 E. SUNRISE WAY  
GILBERT, AZ 85296



William Mundell,

L-0000B-00-0105

We live and own a house that is next to the Santan Power Plant. We are very much opposed to the expansion of this plant.. We cannot understand why you support this proposal, and are very disappointed in the Commission, especially when the power this plant produces may well be used for other places.

We understand that there are many other options available to the power company and certainly hope that they will choose one that is not so totally reckless to this existing and expanding neighborhood.

Sincerely,

*Arlin F. Chester*

*Susan Chester*

Arlin & Susan Chester

AZ CORP COMMISSION  
DOCUMENT CONTROL

2001 MAR 14 A 10:48

RECEIVED

ORIGINAL

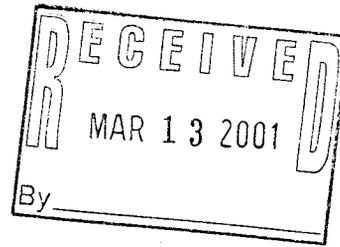
March 9, 2001

William Mundell, Chairman  
Arizona Corporation Commission  
1200 West Washington  
Phoenix, Arizona

RECEIVED

2001 MAR 14 A 10:49

AZ CORP COMMISSION  
DOCUMENT CONTROL



RE: Salt River Project Santan electrical power generating facility expansion  
Docket #: L-0000B-00-0105

Dear Chairman Mundell,

I am writing to you regarding the proposed expansion of the Salt River Projects' Santan electrical power generating facility at Warner and Val Vista Roads in Gilbert. I request that you, as my elected representative in this matter, deny SRP's request to expand the Santan facility.

Unlike twenty years ago, the SRP Santan facility now sits in the heart of a highly residential and family oriented community. The demographics surrounding the SRP Santan facility have changed greatly in recent years, and this area is not where a power generating facility of the magnitude proposed by SRP should be located. According to the Maricopa County Tax Assessor, there are now more than 15,000 homes within a two mile radius of the SRP Santan site. This represents nearly 50,000 people, about one third of which are school age children. As any reasonable person can conclude, a power generating facility of the magnitude proposed by SRP should not be located in a highly residential area such as this. Please also bear in mind that the residents of this area are among the most highly educated and vote among the highest percentages of anywhere in Arizona. We will remember how you vote on this issue when we go to the polls for many years to come.

Again, I ask you as my elected representative in this matter, to deny SRP's request to expand the Santan power generating facility at Warner and Val Vista Roads in Gilbert.

Thank you for your time and consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Glenda Lathrum', written in a cursive style.

Glenda Lathrum  
2243 East Finley Street  
Gilbert, Arizona  
telephone: 480-507-8331