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Desert Citizens Against PollutionAntelope Valley Air Pollution Control Board
[REDACTED]

July 18, 1998

Dear Board,

It has come to our attention that you are preparing to amend Rule 219-Equipment Not Requiring a Permit. This amendment may preclude review by the Air Board of the Bio Gro Sewage Sludge Project just approved by the LA County Board of Supervisors.

We urge you not to make any formal decision on this rule under further analysis can be done. This amendment may exempt agricultural equipment such as tractors, radial arm stackers, scarabs, trucks, and other equipment that Bio Gro would use on site in its sewage sludge operation. Since the Air Board has little or no jurisdiction over fugitive emissions from agricultural operations, requiring permits for equipment may be the only opportunity to mitigate air borne emissions from this project.

I am attaching a letter by Dr. Suresh D. Pillai which was submitted to the La County Board of Supervisors in July. This letter describes the hazards from pathogens which are emitted from sewage sludge operations; Dr. Pillai has recently completed a study of such pathogens at a sewage landspreading operation in Sierra Blanca, Texas.

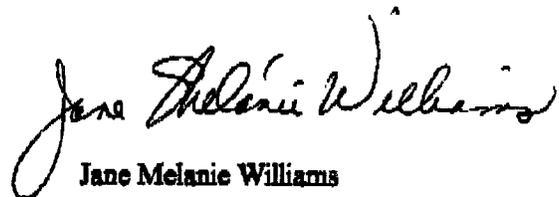
Mr. Lyle Talbot will be in Chicago at the National Restoration Board Advisory Conference and I will be in Atlanta meeting with Dr. Barry Johnston, director of the Agency for Toxic Substance Disease Registry on Tuesday, otherwise we would both appear in person at this public hearing to present testimony. We respectfully request an opportunity to discuss with your staff exactly what the effects of this amendment would be, and what effect it would have on the Board's jurisdiction over the Bio Gro project before you make a final decision on this amendment.

Thank you for your kind consideration of this matter.

Sincerely,



Lyle Talbot



Jane Melanie Williams

Dedicated to the protection of the desert and its peoples.

Suresh D. Pillai, Ph.D.
Assistant Professor of Environmental Microbiology
Texas A&M University Research Center

[REDACTED]

July 3, 1998

**Supervisor Molina, Supervisor Burke, Supervisor Yaroslavsky,
Supervisor Knabe and Supervisor Antonovich.**
Los Angeles County Board of Supervisors

[REDACTED]

Re: Antelope Valley Composting Facility-Project No: 92-206.

Dear Supervisors,

As per the request of Kernross Estates, I have closely reviewed the Wheelabrator Water Technology commissioned Final Environmental Impact Report (Response To Comments), the Rosamond Community Services District's document as well as the Los Angeles County Department of Health Services'-Public Health Impact Report on the proposed windrow composting project at Antelope Valley. Based on my experience as an environmental microbiologist, I find this project to have the potential of adversely impacting the public health of the residents in nearby communities.

environmental microbiologist with over a decade of both field and

overlooked and need to be studied. Based on my experience dealing with bioaerosols and potential public health risks, I feel I need to bring my concerns to your attention. I have taken the liberty of detailing my concerns as follows:

Mechanical Agitation and Pathogen Aerosolization

Locating an open windrow composting facility that handles 500 wet tons of biosolids per day very close to population centers can be dangerous given that microbial pathogens do get aerosolized during the mixing. Contrary to what the FEIR states, there is a plethora of published findings, demonstrating that a variety of bacterial, fungal, and viral pathogens do become aerosolized whenever biosolids or waste materials are handled. The LA County Department of Health Services' argument that treated biosolids contain "approximately 2000 colony forming units of bacteria *per gram* and 2000 plaque forming units *per gram*" and hence are not an issue in this project is tenuous considering that this operation is slated to handle 500 wet tons of fresh biosolids every day. Since this operation relies on an active mixing, aerosolization will occur. The comment that "health risks are mainly applicable to on-site workers" is rather cryptic especially since a community is to be located within only 2 miles of this planned facility. There is a strong likelihood that individuals at the planned community of Kenross Estates will be exposed to aerosolized pathogens.

I have been involved in a research project which investigated the potential aerosolization of microbial pathogens from the land application of Class B biosolids on rangeland. This land application program is one of the largest commercial biosolid land-application projects in the United States, covering approximately 7.2×10^7 m² of rangeland in West Texas in the town of Sierra Blanca. During the design phase of this particular operation, extreme care was taken to a) locate the application fields *downwind* from the population center b) make sure that the closest population center was at least 4 miles from the application sites, c) limit the biosolid application to only 3 dry tons/acre/year as a semi-solid cake form, and d) institute rigorous biological, physical, and chemical monitoring of aerosols.

Yet, even under these stringent conditions, we noticed that the mechanical agitation of biosolids caused the aerosolization of a variety of microbial pathogens. Pathogenic bacteria such as *Salmonella* spp. averaged 300 Most Probable Number (MPN)/m³ of air at the biosolid loading and application sites. The levels of fecal indicator viruses averaged around 1000 virus units (PFU)/m³ of air. During wind gusts of even as low as 10-15 mph (that at times are in the direction of the population center), we noticed these pathogenic bacteria at these same

locations to reach 1000 MPN/m³. We have, also on occasions detected *Salmonella* spp. at levels up to 3000 MPN/m³ four miles downwind at the interface of the population center-application sites. The detection of *Salmonella* spp at the population center-rangeland interface is even more significant considering that a small hill is located between the rangeland and the site where the samples were collected. The detection of microbial pathogens at the population interface is proof as to how wind gusts and wind patterns can expose residents can aerosolized pathogens. Some of these results have already been published (Pillai et al., 1996; Dowd et al., 1997).

The point I am trying to emphasize is that aerosolization of a wide variety of microbial pathogens *do occur* from sites whenever biosolids or waste material is handled. The pathogens levels and transport are dictated by the source material, wind speeds, wind directions and mechanical agitation. I do not agree with the Final Environmental Impact Report's assertion (based solely on a few limited studies) that viruses and other pathogens are not generated from biosolids or wastewater. A number of papers have been published over the last few years (Brenner et al., 1988; Lighthart and Shaffer, 1995; Pillai et al., 1996; Dowd et al., 1997) documenting that aerosolization of microbial pathogens is strongly linked to waste application practices, biosolid handling, wind patterns, and micrometeorological fluctuations. It is important to bear in mind that it is pathogen aerosolization from the biosolids under the various stages of composting that is important, and not necessarily, aerosolization from the finished compost product.

I agree with Rosamond Community Services District's contention that "rafting" of pathogens in aerosols is critical, and it is key when interpreting the importance of wetting, drying, and agitating compost piles. There are a number of published studies (Russ and Yanko, 1981; Hussong et al., 1985; Haug, 1993) documenting how regrowth of *Salmonella* spp can occur even in composted biosolids. Russ and Yanko, (1981) reported that if the temperature dropped to around 20-40°C and in the presence of moisture greater than 20%, *Salmonella* regrowth was observed. Thus maintaining the compost surface (where there is the greatest probability that the elevated temperatures may not be maintained) at 37% moisture content could actually promote pathogen regrowth. Contrary to what the LA County Dept. of Health Services' Public Health report states, the problems that cause regrowth have not been completely elucidated and are still being resolved in many laboratories around the world. It is primarily for this reason that extensive microbiological tests are still mandated to verify the non-pathogenicity of the finished product. In a report published by the US EPA it has been shown by Yanko (1988) that out of a total of 208 finished

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windrow composted samples that were tested for *Salmonella* spp., this pathogen was found (as many as 58 organisms) in as many as 57% of the finished composted samples. It is important to keep in mind that any small fluctuation in either temperature, moisture or microbial population levels can quickly induce pathogen proliferation within composted material. What controls pathogen aerosolization in these types of situations is primarily mechanical agitation, and what dictates how far they will move, are the wind speed patterns. The formation of "crusts" have little relevance considering that windrow piles need to be constantly turned.

Public Health Risks Associated with Aerosolized Microbial Pathogens.

It is surprising that the County of Los Angeles Department of Health Services' report on public health issues assumes that "if the particulate emission is known and the microbe density is known then it is a simple matter of stating the microbe emission as the particulate rate times the microbe density". Contrary to this rather simplistic explanation, one needs to employ complex mathematical models to predict the transport of aerosolized microorganisms (Pasquill, 1961; Lighthart and Frisch, 1976). These models require inputting variables such as "plume spread factor", "source height", "molecular diffusion coefficients", "inactivation constants for the various pathogens", etc. More importantly, to determine the overall rates of microorganism release from a particular source actual sampling data is required.

We have had to employ complex mathematical models in our work to determine the potential public health risks arising from the mechanical agitation of the biosolid material. Using microbial sampling data, we have employed the above mentioned models to quantify the health risks from aerosolized pathogens (Dowd et al., 1998). The risks were estimated at varying distances from the location where the biosolid material was being agitated. As per current US EPA guidelines, the annual risks of microbial infection should not be greater than 1 in 10,000 persons. Using conservative estimates, and a β -distribution probability model (Rose and Yates, 1998) we calculated that the community located 10 km (6 miles) away from the site would have a yearly rate of 6.5 bacterial infections per 10,000 individuals. This value is important considering that the biosolid volumes that are handled at the site in Texas is much less than what is planned at the composting facility in Antelope Valley. Moreover, at Antelope Valley, the composting facility will be directly upwind, the wind speeds are greater, and the closest planned community is only about 2 miles from the site.

The point I am trying to emphasize is that new studies are identifying and quantifying the public health risks from biosolid handling and application. There is still a significant lack of information on the issue of bioaerosols from biosolid facilities and composting operations. Monitoring studies using contemporary screening tools are urgently needed. Comprehensive scientific studies are needed regarding the aerosolization of pathogens from finished compost material and their potential impacts on neighboring communities. *The present lack of information should not be taken as an indication that there are no risks.*

In conclusion, locating a composting facility that will mechanically mix large quantities of fresh and composting biosolids upwind of population centers can pose a serious health hazard to public health. The compost facility should be located at a sparsely populated area downwind from the nearest population center which should be situated at least 10 miles (based on our studies) from the compost facility. If not, the process should be enclosed to allow for better control. More importantly, a rigorous and comprehensive bioaerosol monitoring program should also be instituted.

Sincerely,



Suresh D. Pillai, Ph.D.
Assistant Professor of Environmental Microbiology
Environmental Science Program
Texas A&M University Research Center

cc. Alan Joelson, David E. Cranston

attachments: Cited References

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