COMMONWEALTH OF PENNSYLVANIA
HOUSE OF REPRESENTATIVES
AGRICULTURAL AND RURAL AFFAIRS COMMITTEE
ENVIRONMENTAL RESOURCES AND ENERGY COMMITTEE

In re: Land Application of Biosolids

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Stenographic Report of hearing
held in Majority Caucus Room,
Harrisburg, Pennsylvania

Wednesday
May 17, 2000
10:00 a.m.

ARTHUR HERSHEY, CHAIRMAN, Environmental Resources & Energy
RAYMOND BUNT, CHAIRMAN, Agriculture and Rural Affairs
CAMILLE GEORGE,CHAIRMAN

MEMBERS OF THE COMMITTEES

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Hon. Timothy Solobay
Hon. Sara Steelman
Hon. Jerry Stern
Hon. Dan Surra
Hon. Gregory Vitali

Also Present:

Walter C. Crawford
Legislative Research Analyst

Reported by:
Dorothy M. Malone, RPR

I N D E X

CHAIRMAN HERSHEY: The hour of ten o'clock has arrived. I would like to welcome everyone to this joint hearing being conducted by the Environmental Resources and Energy Committee and the Agriculture and Rural Affairs Committee on the subject of land application of biosolids. I am Representative Art Hershey, Chairman of the Environmental Environmental Resources and Energy Committee. Co-chairing this hearing with me is Representative Raymond Bunt of Montgomery County, Chairman of the Agriculture and Rural Affairs Committee.

I want to say at this time we want to start on time and we are going to keep our schedule on time. Other people have things to do.

Since 1975, Pennsylvania has authorized the use of biosolids for mine reclamation, forestry restoration and as nutrient management material for agriculture purposes.

For many years, the program seems to have been working rather well. It allowed your local wastewater treatment plants to utilize the residue or biosolids that remain after they treat the wastewater from our cities, towns and boroughs. It provided a better alternative than taking the biosolids to a landfill.

Over the past year, concerns have been expressed about the long-term viability of continuing

with the program for the land application of biosolids.

Questions have been asked recently as to what is the biosolids land application program, how does the program work, what is the effect of the application of biosolids to land, what is the environmental impact, both negative and positive?

These questions were being asked not only among yourselves, but also among members of the General Assembly and members of the two committees represented here today.

Since no one person appeared to have all the answers as to the science and technology relating to the biosolids program, Representative Bunt and I determined that the best way to have a meaningful discussion on this issue was to start out by understanding the program and the product that we are dealing with.

As a result of that determination, we thought it appropriate to bring the two committees together to hear testimony from experts in the field.

Hopefully, after today's hearing, we will all have a better understanding of the process, program and product as it relates to biosolids.

With those comments, I would like to turn the gavel over to my Co-Chairman, Representative Raymond Bunt for some remarks and to call the first

1
2 witness.
3 CHAIRMAN BUNT: Thank you, Representative
4 Hershey for joining me and other members of the Ag and
5 Rural Affairs Committee for this joint hearing on a
6 matter of interest to both our committees.
7 When we agreed to have this hearing it
8 was a priority of both committees to hear factual
9 testimony on the regulatory arena, that is, what rules
10 govern land application of biosolids today. With all
11 the rhetoric we hear, it was apparent that there was
12 a lot of misconceptions about the degree of regulation
13 and oversight which presently exists. As members of
14 the General Assembly, we need to have a better
15 understanding of what is expected of both generators
16 and those whose land apply by those charged with
17 regulating this activity.
18 The second priority was to learn what
19 is being done in the way of research into the effects
20 of land application upon the land, and more importantly,
21 any health risks to the human population as a result
22 of land application. If this is touted as the preferred
23 method of disposal of this inevitable by-product of
24 a growing population, then we need to be assured that
25 it is not only preferred from an economic standpoint,

1 but is safe for the environment and from a human health
2 standpoint.
3 In identifying these priorities for oral
4 presentations at this hearing we were forced to deny
5 time for various groups. And this was done without
6 regard to whether they were generators, plant operators,
7 processors, land appliers or interest groups or individuals
8 with a position either pro or con. We responded to
9 all that they were welcome to submit written testimony
10 and that it would receive serious study, but that time
11 did not allow for all to step before this microphone.
12 We need to start the decision making process and that's
13 what we intend to emphasize today. We need to start
14 the decision making process with impartial "sound science."
15 And so now, to lead off today I welcome
16 Lawrence Tropea, Deputy Secretary of Water Management
17 at the Department of Environmental Protection. He will
18 review for us the rules and regs which today govern
19 land application of biosolids. Mr. Tropea, welcome.
20 MR. TROPEA: Good morning. It is certainly
21 my pleasure to appear before you today to discuss the
22 way DEP regulates the beneficial reuse of biosolids
23 from your local wastewater treatment plants. With me
24 today is Milt Lauch. Milt is the Chief of our Wastewater
25 Management Division and also Tom Sweeney, the Soil

1 Scientist in our South Central Regional Office.

2 Whether we realize it or not, each of
3 us is responsible for the generation of biosolids. In
4 Pennsylvania an estimated 400,000 dry tons of wastewater
5 treatment solids are generated each year by 955 municipal
6 wastewater treatment facilities serving nearly nine
7 million people across the state.

8 Over the year, treatment plant operators
9 have found a variety of ways to deal with this waste
10 through landfilling and incineration. At the same time,
11 plant operators began to recognize that treated wastewater
12 solids, or biosolids, can be safely used as farm
13 fertilizers and in the reclamation of abandoned mines.

14 Today, about 230,000 dry tons of biosolids
15 are land-applied, 106,300 dry tons are landfilled and
16 58,000 dry tons are incinerated.

17 Your local plant operators and DEP now
18 have over 20 years of experience in the land application
19 and regulation of biosolids. Over 1,500 sites have
20 received biosolids and used them without documented
21 adverse surface or groundwater impacts.

22 Treatment plant operators recognized
23 that beneficial reuse of biosolids helps to replenish
24 valuable nutrients and organic materials in soils, and,
25 at the same time, saves local taxpayers money and saves

1 the Commonwealth valuable landfill space.

2 **What are Biosolids?**

3 Biosolids should not be confused with

4 the raw sewage or sewage sludge generated from wastewater

5 treatment plants. Untreated and untested wastewater

6 treatment plant sludge cannot be legally land-applied

7 in Pennsylvania.

8 Biosolids are waste materials that have

9 undergone stabilization treatment to reduce disease-

10 causing organisms, odor and conditions that attract

11 vectors and flies and they must meet specific standards

12 for metals and chemical concentrations.

13 **Biosolids Regulatory Program**

14 The land application and beneficial reuse

15 of biosolids has been regulated in Pennsylvania for

16 more than 20 years. Using this experience and EPA's

17 1993 federal biosolids standards, DEP revised its biosolids

18 regulations in 1997. We have a copy of those regulations

19 here.

20 DEP's regulations were adopted after

21 an extensive public participation process which included

22 input from a series of statewide public meetings and

23 reviews by the Solid Waste Advisory Committee and DEP's

24 Citizens ADvisory Council.

25 I would like to now take a few minutes

1 to outline the protections that are built into these
2 current DEP regulations.
3 Under DEP regulations, your local wastewater
4 treatment plants must assure the quality of the biosolids through
5 process control testing and biosolids testing before
6 the material can leave the plant for land application.
7 There are incentives built into the program that encourage
8 plant operators to develop the highest quality, lowest
9 impact biosolids they can through additional treatment,
10 composting and pre-treatment of effluent coming into
11 their systems.
12 If you have ever gone to a wastewater
13 treatment plant, and as an engineer I know these plants
14 produce a remarkably consistent waste material. These
15 plants treat millions of gallons of water every day,
16 it takes a lot to upset them and affect the chemistry
17 of the sludge they produce. In addition, daily
18 monitoring of the treatment system would detect any
19 unusual circumstances.
20 DEP regulates biosolids based on the
21 quality of the biosolids and sets limitations on use
22 based on that quality. The regulations have two
23 classifications of biosolids.
24 The highest quality biosolids are known
25 as Exceptional Quality, or EQ biosolids. They are treated

1 to the point where they can be used in many general
2 purpose applications like lawns, landscaping and gardens,
3 a real benefit that lowers the cost of biosolids reuse
4 for the generator.
5 The remaining basic class of biosolids
6 are commonly used in agriculture and mine land reclamation.
7 In addition to meeting chemical standards, DEP's program
8 imposes restrictions that limit crop harvesting and
9 animal grazing on sites so they can be successfully
10 or safely applied.
11 We've used composted EQ biosolids ourselves
12 to help landscape our South Central Regional Office
13 grounds.
14 Other restrictions include minimum buffer
15 distances from environmentally sensitive areas like
16 streams, sink holes, occupied dwellings, water sources
17 and wetlands.
18 No biosolids can be applied to flooded,
19 frozen or snow-covered ground; to areas with steep slopes;
20 or to an area that may affect a threatened or endangered
21 species.
22 A DEP general permit must be obtained
23 before wastewater facilities can begin a land application
24 program. The purpose of the permit is to assure the
25 chemical and biological characteristics and treatment

of the biosolids can consistently meet DEP's standards. Three years of biosolids sampling, analytical and process monitoring data, that is all required before a decision on the permit is made.

After DEP reviews the biosolids quality data and they are approved for land application, the plant operator must continue regular process control and product quality monitoring as long as the facility is conducting land application activities. DEP conducts periodic inspections of the facility to verify the process and analytical data and to take samples of the biosolids for analysis. DEP's regulations require local notice and encourage public comment on any proposed land application site. We require all potential land appliers to provide a 30-day notice before the application of biosolids to a particular site and to obtain written approval of the landowner. This notice must be given to DEP, the County Conservation District and all adjacent landowners . DEP also notifies the municipality after receiving the 30-day notice, giving the community prior knowledge of a planned land application activity with approved biosolids.

DEP then conducts a site visit and reviews the applicable conservation plan or nutrient management plan to help determine the level of nutrients the site can accommodate. Limits are set on the amount of biosolids

1 that can be applied based on the nutrients needed by
2 the crops or vegetation on that particular site.
3 If the site is deemed suitable, DEP
4 publishes a notice in the Pennsylvania Bulletin for
5 public comment. These Bulletin notices are available
6 at all times to anyone online through the www.pabulletin.
7 com website.
8 DEP encourages the operator to work closely
9 with the public and the community in addition to providing
10 the official notices required by our regulations.
11 DEP requires continuous monitoring and
12 reporting of process control parameters and biosolids
13 quality throughout the time of land application. DEP
14 conducts periodic facility inspections to verify the
15 integrity of the process and to confirm biosolids
16 quality.
17 DEP requires daily operational records
18 be maintained containing information such as the amount
19 applied, site locations, crop grown and weather conditions.
20 DEP and 28 County Conservation Districts inspect all
21 sites and require annual operation reports.
22 Pennsylvania now has about 735 active
23 permitted land application sites for biosolids. Over
24 the last three years, DEP has investigated 81 complaints
25 involving these sites; many of those complaints were

1 for temporary odor problems. There have been no cases
2 with documented adverse groundwater or surface water
3 impacts.
4 As a result of the 1997 rule changes,
5 Pennsylvania was one of the first states to require
6 treatment plant operators and land appliers to complete
7 mandatory training on how to apply biosolids safely
8 and to understand DEP's regulatory program. This is
9 a copy of the workbook that we use in the training
10 program
11 Over 600 plant operators and land appliers
12 have completed training.
13 DEP also makes significant technical
14 and training information available through its website
15 and the weekly DEP Update newsletter. In addition,
16 County Conservation Districts have held over 80 educational
17 workshops to better inform the public about biosolids.
18 Quite clearly, we have drawn on the
19 experience of local treatment plant operators, DEP's
20 staff and public comments to develop a comprehensive
21 biosolids program, involving quality standards, inspections,
22 reporting and training, coupled with public involvement.
23 **Science and Regulating Biosolids**
24 In addition to 20 years of experience,
25 there has been significant scientific work done to study

1 the environmental impacts and effectiveness of the land
2 application of biosolids.
3 The process used by EPA to develop its
4 regulatory requirements in 1993 was based on a combination
5 of best available technology and limiting environmental
6 and health risks. The process involved selecting
7 representative pathways by which individuals - humans,
8 animals and plants - could potentially become exposed
9 to pollutants of concern that can be present in raw
10 sludge and biosolids. EPA then set pollutant limits
11 and management practices that would reasonably protect
12 any individual exposed to land-applied biosolids.
13 In 1996, the National Academy of Sciences
14 reviewed biosolids reuse rules and potential risk and
15 concluded that "the use of these materials in the
16 production of crops for human consumption, when practiced
17 in accordance with federal guidelines and regulations,
18 presents negligible risk to consumer, to crop production
19 and to the environment."
20 Just last year the National Institute
21 for Occupational Safety and Health (NIOSH) conducted
22 a study in response to a request for a health hazard
23 evaluation to mine workers at the Power Operating mining
24 facility in Clearfield County. The request by the United
25 Mine Workers asked NIOSH to look at exposures that might

1 be occurring with the application of biosolids during
2 strip mine reclamation activities.
3 NIOSH found no human enteric pathogenic
4 bacteria in the samples. This finding indicates that
5 there was no residual biological activity specifically
6 related to the biosolids.
7 A recent study by Dr. Richard Stehouwer
8 of the Pennsylvania State University indicates that
9 pollutant and metal concentration in Pennsylvania
10 biosolids are already significantly lower than allowable
11 DEP and EPA limits.
12 And our research does not end there.
13 In October, we awarded a $32,900 grant to Penn State
14 to study biosolids reclamation in a watershed in Clinton
15 County.
16 **Examples of Local Biosolids Programs**
17 Since 1997, DEP has issued 143 general
18 permits for land application of biosolids under the
19 new regulations without a documented environmental
20 problem. There are many successful examples of land
21 application programs in Pennsylvania.
22 Just down the road, the Carlisle Water
23 Pollution Control Facility in Cumberland County has
24 been beneficially reusing biosolids since 1981. Their
25 land application program includes over 25 permitted

farms totaling over 1,800 acres. The borough land applies an average of 1,900 dry tons of lime-stabilized biosolids per year, while continually keeping the public informed of its activities.

Carlisle was recognized by the Pennsylvania Water Environmental Association in 1997 as having the best biosolids program in the state.

You can even take a tour of their program online through DEP's biosolids webpage. I might also add that, as a result of the webpage, Carlisle has been contacted by plant managers in other states and countries to learn more about their program.

The Clearfield Municipal Authority in Lawrence Township has successfully land-applied biosolids for several years. In addition to the beneficial land conditioning that has occurred, the borough has saved its taxpayers about $45,000 a year versus landfilling.

Communities like the Allegheny County Sanitary Authority, Ephrata Borough in Lancaster County and the University Area Joint Authority in Centre County have farmers on waiting lists to receive biosolids.

Biosolids are being successfully used to clean up acid mine drainage on thousands of acres of mine sites. The beneficial reuse of biosolids in restoring drastically reduced lands has succeeded in

1 developing productive soils capable of supporting
2 vegetative cover, eliminates exposed surfaces and reduces
3 acid mine runoff from the sites that results in an overall
4 improvement of water quality in the Commonwealth.
5 The Lobb Mining Company in Snow Shoe
6 Township, Centre County, is a good example. They have
7 used biosolids in areas where other materials failed
8 to achieve site reclamation. Now over 200 acres of
9 barren strip-mined land has been resuscitated with biosolids.
10 **Conclusion**
11 Your local wastewater treatment plant
12 operator and DEP have over 20 years of experience in
13 land applying and regulating biosolids in ways that
14 protect human health and the environment.
15 Scientific studies have shown that the
16 land application of biosolids can improve soil conditions
17 and increase crop growth and production when properly
18 applied.
19 Thousands of acres of mined land in
20 watersheds all across Pennsylvania have benefited from
21 the nutrients treated biosolids provide.
22 DEP will continue to improve and update
23 our biosolids program in response to the latest science
24 so we can help wastewater treatment plant operators
25 in your communities safely provide the environmental

1 and economic benefits of land application of biosolids.
2 I want to thank you again for this opportunity
3 to testify. My colleagues and I would be happy to answer
4 any questions you may have.
5 CHAIRMAN BUNT: Thank you, Mr. Secretary
6 for that informative presentation.
7 Mr. Tropea has indicated in his remarks
8 that he will entertain questions. And I certainly want
9 to afford members of the Committee that opportunity.
10 But before we do so, let me propose a couple of ground
11 rules. In order to stay within our time frame I propose
12 to offer each member of both Committees to ask one question,
13 without follow up, in the first "round" of questions.
14 If time allows, then I will permit a second round. In
15 any case, we will move to the next speaker at the
16 scheduled time.
17 Furthermore, as the Chair, and with the
18 indulgence of the other members, I reserve the right
19 to ask Mr. Tropea the first question.
20 REPRESENTATIVE GEORGE: Mr. Chairman,
21 I am behind you. Mr. Chairman, what is the purpose
22 if you are going to keep us to one question?
23 CHAIRMAN BUNT: Because we only have
24 three hours.
25 REPRESENTATIVE GEORGE: I couldn't care

1 whether you have 30 minutes. We are here to get the
2 truth, are we not?
3 CHAIRMAN BUNT: We are here to get the
4 truth.
5 REPRESENTATIVE GEORGE: And you only
6 have one side of the quotient here; is that not true?
7 I am going to tell you when I ask a question, you are
8 going to have to have me delivered out of here because
9 I am going to ask more than one question.
10 CHAIRMAN BUNT: Per round.
11 BY CHAIRMAN BUNT:
12 Q Mr. Tropea, as you indicated, land application
13 of biosolids has been a permissible, but regulated
14 activity in Pennsylvania for many years. In this time
15 there have been remarkably few documented incidents
16 of the activity putting individual persons at personal
17 risk. However, it has recently come to my attention
18 that your Department has completed an investigation
19 into the possibility that biosolids contributed to the
20 death of a young man in Clearfield County. Would you
21 care to comment on these allegations and the investigation
22 that you conducted?
23 A Yes, Mr. Chairman. Tony Behun's death
24 is a tragedy. As a parent of two children I can vividly
25 imagine the deep grief of Tony's family, friends and

1 other members of the community.

2 At the time of Tony's death in 1994 we

3 were not made aware of any possible connection between

4 his death and biosolids. But in 1999 as soon as we

5 found out that there was possibly some connection, DEP

6 and the Pennsylvania Department of Health began an

7 investigation. Last week we provided a report on what

8 we found to his family.

9 I can assure you that if that report

10 is in any way incomplete, we want to know the truth

11 and will continue to work to get to the bottom of this.

12 We are willing to work with Tony's parents or anyone

13 else that has pertinent information to piece together

14 any connection there might be between his death and

15 biosolids. And I would encourage and welcome any of

16 that information to be brought forward. DEP will sit

17 down with those folks, we will review it, we will talk

18 about it.

19 It is, of course, very difficult to piece

20 together the events that happened almost six years ago.

21 But I can assure you that we want to help in any way

22 that we can.

23 I think it is also important to note

24 that according to the Pennsylvania Department of Health

25 no other deaths or serious illnesses have been linked

1 potentially to biosolids.

2 CHAIRMAN BUNT: Thank you. I would now

3 like to offer Mr. Hershey, who is Chairman of the

4 Environmental Resources and Energy Committee an opportunity

5 to ask a question.

6 CHAIRMAN HERSHEY: Thank you. I am going

7 to pass at this time.

8 CHAIRMAN BUNT: Mr. George. Mr. George

9 is the ranking chair of the Energy Resources and

10 Environmental Committee.

11 REPRESENTATIVE GEORGE: Mr. Chairman,

12 first I apologize for the voice. But I don't apologize

13 why we are here. Mr. Chairman, it is not my purpose

14 to add any dialogue that won't be factual, but the gentleman,

15 the deputy just, and I am sure he is very serious where

16 they are sorry about the death of this young man.

17 MR. TROPEA: That is correct.

18 BY REPRESENTATIVE GEORGE:

19 Q I still can't find out from anyone why

20 you folks insisted that it was a bee sting and that

21 you denied any claim, in fact in your testimony, you

22 said you checked the material that was laid on the ground.

23 The same material that this young man fell in. His

24 mother is present and maybe we want a good hearing.

25 You can ask her some questions because Mr. Seif apologized

1 in that you didn't have all of the information when
2 you decreed that the boy's fall in that mud or sludge
3 has nothing to do with his demise and nothing to do
4 with the lesions on his arms and body and nothing to
5 do with the burning of his skin. And yet you insisted
6 when there was a complaint that you went in there and
7 somebody went in there and investigated thoroughly.
8 Mr. Speaker, I am not here to make trouble.
9 I am here to make it available that we can process sludge
10 and put it on the ground and take care of what you said
11 what we cherished.
12 But the other day I called the Secretary
13 and complained about sludge in our area, sir. Four
14 days later someone went out and checked it. Two men
15 live in my hometown that are inspectors. Why, sir,
16 does it take that long to investigate?
17 A Let me address your --
18 Q Please just address it very principally
19 like I am going to address you, not with a long delay.
20 A Let me address a couple of comments that
21 you made. First of all, we do apologize for the error
22 that was made in the comment document and we have done
23 that in a letter to the parents. I again go back to
24 the point that if there is additional information that
25 is available from any source, I would like to encourage

1 that that information be provided to us because DEP
2 is as interested in finding the truth here as anybody
3 else.
4 Now, in regards to the specific comment
5 that you made about the complaint, we would be glad
6 to follow up and find out why it took four days. I
7 would be glad to get back to you on that particular
8 point.
9 REPRESENTATIVE GEORGE: Mr. Chairman --
10 CHAIRMAN BUNT: Mr. George, I did, in
11 my remarks, offer to each member an opportunity to ask
12 one question and with no follow ups. I did that, Mr.
13 Chairman, so that we could extend the courtesy to all
14 the members of both Committees and to the Pennsylvania's
15 public that want to have some information. Now, I am
16 going to ask you again, Mr. Chairman if you could ask
17 one question, and I will permit a liberty with you that
18 I will not permit with another member. Will you ask
19 a question with no follow up? I am going to permit
20 you a second question.
21 REPRESENTATIVE GEORGE: Mr. Chairman,
22 I thank you. I say this to both of you chairmen. I
23 know you are honorable people and I know you want to
24 get to a resolve, but a resolve will not be forthcoming
25 in that there is nobody that is going to sit there today,

1 Mr. Speaker, that are against sludge and want to tell
2 you the story about this boy. So now we have in this
3 hall a lot of people involved with sludge, a lot of
4 people from the Department, a lot of people that work
5 here. Mr. Speaker, I trust you implicitly. Are we
6 going to be able to get the reason? Maybe just what
7 you hear from some of these people will make it possible
8 to dump sludge and dump it safely.
9 Now my question to the man, and I thank
10 you, and I will grant you that same flexibility whenever
11 I am in charge of the Committee. Thank you.
12 BY REPRESENTATIVE GEORGE:
13 Q Mr. Tropea, do you have any evidence
14 that the sludge that may have killed that young man
15 was not the finest quality sludge that you tested?
16 A That particular sludge is tested and
17 permitted to be placed on that site.
18 Q Mr. Tropea, did you test it when the
19 complaint came out that the boy died rather than insist
20 that it was a bee sting? You know, this just isn't
21 right. Anybody sitting here, republican or democrat,
22 whether you favor sludge or you don't favor sludge would
23 have wanted an investigation of why that boy died.
24 A Mr. George --
25 Q Did you check the material or did you

1 fail?

2 A Mr. George, we apologize for the error

3 that we made. I will be glad to make that report available

4 to the Committee that we did file. We have copies with

5 us today and it does constitute our current knowledge

6 of the situation.

7 Q You know, in this complaint I called

8 the Secretary. He told me that they only had 25 complaints.

9 You admit to 81.

10 A To 81 in three years, sir.

11 REPRESENTATIVE GEORGE: And then you

12 say to me, you know, you can dump this sludge and there

13 is no problem. Yet you are going to work feverishly

14 as the years go by to make sure you can better and improve

15 your methods. What we are trying to tell you here,

16 you have to improve your methods immediately, immediately.

17 And sir, you are going to improve those methods. And

18 I don't want an apology after somebody dies. I want

19 you to take the same energy that you issue an apology

20 for to go up and test the land of the Commonwealth when

21 they put sludge down and some unscrupulous individual

22 that stops half way and puts a ton of leachate or something

23 in. I don't say all leachate is bad, but I think you

24 are not reviewing and testing in an appropriate manner.

25 CHAIRMAN BUNT: Mr. George, would you

1 please extend to the Chair the courtesy of trying to
2 get as much information as we possibly can do by one
3 o'clock.
4 REPRESENTATIVE GEORGE: I thank the Chair.
5 CHAIRMAN BUNT: Now I certainly, I certainly
6 won't be able to get all the information that even I
7 need by one o'clock. But if this meeting goes well,
8 we certainly would entertain others.
9 REPRESENTATIVE GEORGE: Mr. Chairman,
10 I apologize, but I will not apologize to my continuation
11 to get these answers. Thank you, my good colleague.
12 CHAIRMAN BUNT: Thank you, Mr. Chairman.
13 Mr. Vitali.
14 REPRESENTATIVE VITALI: Thank you, Mr.
15 Chairman. I guess I first want to make a suggestion
16 because I think the constraints put on us are not the
17 way to get at the truth. I think the members should
18 have an unlimited ability to ask questions. In fact,
19 if it runs over --
20 CHAIRMAN BUNT: Mr. Vitali, I only have
21 three hours because other members have commitments today.
22 Wil you please honor or at least extend the courtesy
23 to your colleagues.
24 REPRESENTATIVE VITALI: We are not back
25 until June 5th. We have plenty of days to work. There

1 is no hurry. This is a serious issue. Important questions
2 have been raised. I didn't come here to have this be
3 a dog and pony show. I came here to learn about the
4 issues and I came here to be able to cross examine witnesses
5 in an effort to get at the truth. You can't do that
6 with simply one question and no response. We don't
7 know that.
8 CHAIRMAN BUNT: Your comments are entered
9 for the record. Would you please ask one question?
10 REPRESENTATIVE VITALI: My second point
11 is this. I don't know if we have any conflicts. I
12 know at least the first two based on the testimony references
13 are that they are pro sludge, but do we have anyone
14 here today who is going to raise questions about the
15 metals, the pathogenes, the argonic toxins being applied to
16 farmlands and the foods that we eat? Are there going
17 to be any witnesses here today who are going to present
18 that so we can balance those perspectives?
19 CHAIRMAN BUNT: Mr. Vitali, you were
20 here for my opening remarks.
21 REPRESENTATIVE VITALI: But I did not
22 understand any of these witnesses would be able to raise
23 these concerns.
24 CHAIRMAN BUNT: I certainly extend to
25 my colleagues who heretofore never had a meeting like

1 this. Is that not true? We are extending to all
2 Pennsylvanians and also to our colleagues the opportunity
3 to get as much information as we possibly can. We cannot
4 get all of that today, Mr. Vitali. We will get what
5 we can today.
6 REPRESENTATIVE VITALI: But you need
7 to present both sides. If there is not adequate time --
8 CHAIRMAN BUNT: Mr. Vitali, I can't make
9 my comments any clearer.
10 REPRESENTATIVE VITALI: I am not sure
11 you are responding to my comments.
12 CHAIRMAN BUNT: Well, you haven't asked
13 a question yet, Mr. Vitali. Please do that.
14 MR. VITALI: Well the question to you
15 is are we going to get witnesses who are going to present
16 the opposing point of view?
17 CHAIRMAN BUNT: Mr. Vitali, you are denying
18 everybody in this room an opportunity of getting information.
19 REPRESENTATIVE VITALI: I think what
20 I am trying to do is to create a framework where we can
21 get a complete set of information.
22 CHAIRMAN BUNT: You would get a framework
23 if you would adhere to at least the ground rules.
24 REPRESENTATIVE VITALI: I want to be
25 a part of an exercise that legitimately gets at the

1 truth. That is all I want. I don't have any preconceived
2 opinions about this. I know that, for example,
3 Pennsylvania Environmental Network has asked to testify
4 and there are experts in this capitol today. I am just
5 trying to get a sense can we get both sides. I have
6 no position on this issue right now. Although frankly
7 this whole process is raising questions in my mind that
8 maybe there is something to hide. I didn't come in
9 here --
10 CHAIRMAN BUNT: I have asked science
11 here today. That is what it is.
12 REPRESENTATIVE VITALI: Okay. They are
13 my comments.
14 BY REPRESENTATIVE VITALI:
15 Q My questions basically surround, again,
16 the concerns are these alleged toxins on farmland. I'd
17 like to talk a little more about the testing done on
18 the foods produced by the crops, the frequency of the
19 testing, the type testing, whether it is done on what
20 percent of the crops, how often it is done; one. Two,
21 is testing done on the soils of these farmlands? How
22 often is testing done on the soils to see if they contain
23 these pathogens, heavy metals? How often is that testing
24 done and on what percent of the various sites? And
25 then third, the testing done on the sludge before it

1 gets put on? I mean talk about testing at these three
2 points on what percent of the sites and how frequently
3 is the testing done and the results and publication
4 of the results.
5 A Sure. I am going to ask Mr. Sweeney
6 to respond.
7 MR. SWEENEY: In regards to the testing
8 of the sewage sludge prior to land application, we have
9 three quality criteria that biosolids needs to meet
10 prior to being suitable for land application. The first
11 being pollutant concentration. These are trace elements
12 from arsenic, cadmium, chromium, copper through zinc.
13 We have limits in our regulations that mirror the federal
14 limits that biosolids must meet in order to be land
15 applied.
16 The second quality criteria is pathogen
17 reduction. We require that biosolids meet standards
18 for pathogen reduction prior to land application. The
19 standards are the same as what is in the federal 503
20 requirement.
21 The third quality criteria is what is
22 called vector attraction reduction. It is stabilizing
23 the material to a point that it will not attract vectors
24 that may carry disease offsite.
25 These three quality criteria must be

1 met prior to land application. Part of our permitting
2 process we assure that they are met before we give anybody
3 a permit. It is part of my duties in the field as an
4 inspector, I do go to wastewater treatment plants. I
5 review their samples. I will take samples of my own
6 to make sure that they are meeting the quality criteria
7 as required in the permit.
8 Soil sampling, any farm or any site in
9 which biosolids --
10 BY REPRESENTATIVE VITALI: (To Mr. Sweeney)
11 Q Before you move along, I think my question
12 was the frequency of testing and the percentage of sites
13 that are tested. That was the question. What percent
14 of the sites -- what percent of the soil is tested and
15 the frequency of the testing.
16 A Any site proposed for land application
17 must establish background results for pollutants. The
18 metals I talked about, arsenic through zinc. That is
19 the only time that the soils need then to be sampled.
20 The cumulative effect of adding biosolids needs to be
21 tracked knowing the concentration in the biosolids,
22 how much is put down, that is tracked. But essentially
23 our regs provide for an initial background sample and
24 then a cumulative tracking through recordkeeping.
25 Q This is tested just one, the facility

1 is just tested one time?

2 A Correct, to establish background.

3 Q And as this all keeps going there is

4 no testing there?

5 A There is no testing. What is done is

6 we do a cumulative, using records, we calculate a cumulative

7 pollutant loading rate to assure that levels in the

8 soils do not become a problem. Again, we, the Department

9 has access to all these sites and can sample and we

10 have sampled soils in the fields and mines that have

11 been using biosolids for years.

12 REPRESENTATIVE VITALI: Thank you.

13 CHAIRMAN BUNT: Representative Rubley.

14 Any questions, Mr. Vitali, would you please submit your

15 questions?

16 REPRESENTATIVE VITALI: Well, it is not

17 a different question. It is the same question which

18 wasn't answered.

19 BY REPRESENTATIVE VITALI: (To Mr. Sweeney)

20 Q The food that is produced by the farms

21 are they tested at all?

22 A No, it is not part of our regulations

23 that food grown using biosolids is tested.

24 Q And the soil itself versus the sludge

25 before it goes to the soil?

A Our regulatory emphasis is on the quality of the material being generated. So we test what is being generated. We establish backgrounds. We do not test --

Q No testing on the soil?

A Not after initial application unless we feel it is necessary.

REPRESENTATIVE VITALI: Thank you.

CHAIRMAN BUNT: Thank you, Mr. Vitali.

MR. TROPEA: Just one point of clarification what Tom was saying is that DEP does not have standards for food products, but those, of course, the Department of Agriculture has established standards in that area.

CHAIRMAN BUNT: Those members can only get to one question across, I am going to request that they forward additional questions and hopefully you folks will answer them at a later time.

MR. TROPEA: Yes, Mr. Chairman, we would be glad to.

CHAIRMAN BUNT: Representative Rubley.

REPRESENTATIVE RUBLEY: Thank you, Mr. Chairman and thank you, Mr. Secretary for your testimony this morning.

BY REPRESENTATIVE RUBLEY:

Q A number of years ago when I served as

1 solid waste coordinator in Chester County, I was very
2 much involved with the application of sludge on fields and
3 worked closely within DER and we monitored the whole process.
4 And at that time I felt there were some loose ends and
5 some avenues of concern that needed to be addressed.
6 I am very pleased that with the new regulations you
7 have addressed so many of those concerns then.
8 One of the major concerns that we had
9 at that point, I was working with the Chester County
10 Health Department was septic haulers were going around
11 the county and collecting septage from a number of different
12 households and then applying it directly to farmland.
13 Would you explain what is being done to regulate septage
14 before it is put on farmland?
15 A Yes. We will let Tom address that one.
16 MR. SWEENEY: Our regulations do provide
17 for a general permit to allow septage haulers to land
18 applied treated residential septage. Any other type
19 of land application is prohibited by our regulations.
20 We have taken quite a few steps to make sure that we
21 don't have illegal disposal. The Department in '97
22 requires all septage haulers to be registered. And
23 additionally, we have the permit process for land application
24 of septage.
25 BY REPRESENTATIVE RUBLEY: (To Mr. Sweeney)

1 Q Could you explain how septage haulers
2 go about treating the septage before they apply it?
3 A Our requirements are that septage be
4 treated with typically it is lime. Enough lime is added
5 to the volume of septage to bring the ph to 12 for 30
6 minutes. That is the minimum treatment standard.
7 Additionally, none organic material needs to be screened
8 prior to land application. That is the basic treatment
9 process for land applied septage.
10 CHAIRMAN BUNT: Representative Major.
11 REPRESENTATIVE MAJOR: Thank you, Mr.
12 Chairman.
13 BY REPRESENTATIVE MAJOR: (To Mr. Sweeney)
14 Q I notice on your page three of your testimony
15 that the Department's regulations require local notice
16 and encourage public comment on any proposed land application
17 site. I'm wondering currently does the Department allow
18 municipalities to hold public hearings prior to issuing
19 a permit, this land application? And if the answer
20 is no, why not?
21 A We don't have a specific requirement
22 that requires hearings to be held, but we have in the
23 past and will continue to do so, if a municipality feels
24 that they need to have an informational meeting and
25 want the Department to come and address some concerns,

1 we have done that on numerous occasions.

2 CHAIRMAN BUNT: There are quite a few

3 other members. Representative Mann from Lehigh County.

4 REPRESENTATIVE MANN: No questions.

5 CHAIRMAN BUNT: Mr. Solobay.

6 BY REPRESENTATIVE SOLOBAY: (To Mr. Tropea)

7 Q Just one question. Again, a yes or no

8 answer, real simple. Was the material this young fellow

9 obviously got contaminated with, was it immediately

10 or shortly thereafter tested after the death?

11 A I can't give you a yes or no answer because

12 it needs a little bit of explanation. The particular

13 exposure that occurred here was 1994. The first time

14 we heard of this possible linkage was 1999. Now testing

15 of that material was done prior to its application as

16 part of the routine permitting program that the Department

17 undertook and that information I believe is available.

18 REPRESENTATIVE SOLOBAY: Thank you.

19 CHAIRMAN BUNT: Mr. Miller of York County.

20 REPRESENTATIVE MILLER: No questions.

21 CHAIRMAN BUNT: Representative Dr. Bastian,

22 Somerset County.

23 REPRESENTATIVE BASTIAN: Thank you, Mr.

24 Chairman.

25 BY REPRESENTATIVE BASTIAN:

1 Q I come from Somerset County and we had
2 a lot of sludge applied in 1980 through land reclamation.
3 Do you have any idea, have you found any problem with
4 groundwater contamination at that time 20 years ago?
5 A We have found no groundwater or surface
6 water contamination as a result of using biosolids in
7 mine drainage reclamation. In fact, we have information
8 that says, you know, the runoff from the site actually
9 improves in its quality in that there is water quality
10 improvement that is associated with reclaimed property
11 through biosolids.
12 REPRESENTATIVE BASTIAN: Thank you, Mr.
13 Secretary. Thank you, Mr. Chairman.
14 CHAIRMAN BUNT: Okay. We will have room
15 for maybe three more questions. Representative Miller
16 from Berks County.
17 REPRESENTATIVE MILLER: Thank you, Mr.
18 Chairman and Mr. Secretary.
19 BY REPRESENTATIVE MILLER:
20 Q In your comments you mentioned that 81
21 complaints were received by the Department and many
22 of those involved odor complaints. And I remember back
23 in the 1980s outside of the City of Scranton, sludge
24 was applied and turned a black culm bank into a beautiful
25 green field that the city at first was very upset about

1 and the local paper editorialized against it because
2 of the horrific odor that happened at the same time.
3 But then a few weeks later once all the black culm bank
4 soils were greened out the people were very happy to
5 see that such a transition was made. What are you doing,
6 the Department, about these odor problems that have
7 occurred, and as you have mentioned, they make up the
8 majority of your complaints?
9 A That is a very good question. Odor is,
10 of course, an issue at times particularly when the material
11 is newly applied or there is rain in its early life.
12 But it tends to be a transitory problem that does go
13 away with time. As you point out, the benefits show
14 up later. We have specific odor requirements in our
15 regulations that we are prepared to enforce as necessary
16 and have enforced. The industry itself in some work
17 that DEP is sponsoring at Penn State with some others
18 is going about a scientific study of odor and what in
19 the materials causes that odor and how we might be able
20 to, in the future, render it a little less odorless.
21 So there is some scientific work under way in that regard
22 and I think there is a lot of interest on DEP's part
23 that maybe that will resolve in some things that can
24 be institutionalized in Pennsylvania.
25 CHAIRMAN BUNT: Mr. Smith, Jefferson

1 County.

2 REPRESENTATIVE SMITH: Thank you, Mr.

3 Chairman.

4 BY REPRESENTATIVE SMITH:

5 Q Mr. Secretary, sometimes I think we get

6 a little confused between the various degrees of which

7 this material is handled or processed. I am wondering

8 if you could just back up and spell it out a little

9 more clearly, I mean, the difference between, say, raw

10 septage, if you will, to sewage sludge to a biosolid

11 that is referred to. We tend to want to kind of merge

12 those all together. And in that sequence I would also

13 be interested in where the Department sees what I would

14 perceive anyway as a further processing to make the

15 use or reuse or disposal of this kind of material more

16 safe and that would be getting into the furtherest end

17 out of composting which I think is something I think

18 is on the horizon which I presume. If you could clarify

19 that in your response composting would be using that

20 with some other organic materials, food waste or yard

21 waste or things like that.

22 A Wastewater treatment sludges are an inevitable

23 by-product of society. The particular materials that

24 are generated at a plant should not be confused with

25 biosolids. That is why I like your question because

1 it does need to be clarified. Biosolids are materials
2 that have been subjected to additional treatment. That
3 treatment can be a lime treatment. It can be generally
4 some sort of a stabilization technology. It can be
5 for some processes they use pasteurization and other
6 ways to treat biosolids.
7 We then have the biosolids materials
8 really into two categories. The exceptional value biosolids
9 that needs some very, very strict requirements and can
10 be used, you know, around your home or as we have in
11 our South Central Regional Office.
12 The second category of biosolids are
13 available for reuse on farmland and in mine reclamation,
14 but only in the context of the associated DEP regulations
15 that really do make sure that it is safe. And someone
16 has just handed me some biosolids here that I can certainly
17 leave with the committees.
18 The septage, of course, is the material
19 that is pumped out of folks' septic systems. That material
20 is, as Tom indicated, under our regulations can be land
21 applied provided that it is lime treated and meets a
22 set of requirements. We think there is certainly some
23 exciting things to do down the road with composting
24 and other technologies in the future. But at this point,
25 and we are open to all those types of ideas, the program

1 we have in place today we think is protective of health
2 and the environment. In the future I think we will
3 have even some additional ideas and benefits for the
4 people of Pennsylvania.
5 CHAIRMAN BUNT: Mr. Surra from Elk County.
6 REPRESENTATIVE SURRA: Thank you, Mr.
7 Chairman.
8 BY REPRESENTATIVE SURRA:
9 Q I'm going to be very quick. I am disappointed,
10 first of all, I would like to get into this more. I
11 would ask my Chairman of the Environmental Committee
12 to hold additional hearings. I am willing to sit here
13 until the cows come home to hear both sides of this
14 issue.
15 In the letter that Secretary Seif sent
16 to the mother of the child that died, the Department
17 has concluded and it states, "After review of the medical
18 records, the death had as a probable underlying cause
19 a pathogen which is not known to be found in biosolids
20 nor is the biosolid environment known to be a suitable
21 media for propogation of this pathogen."
22 The pathogen is, excuse my pronunciation
23 if it is not accurate, is staphylococcus aureus. And
24 that is listed by the Environmental Protection Agency
25 as a pathogen present in land applied sewage sludge.

1 So, your information is not accurate. I personally
2 have been on sites in state forest lands where land
3 applied sewage sludge was put down in an area that was
4 devastated by forest fire, and in my tour of the area
5 with that committee a few years ago, we found a piece
6 of a transformer, electronic switches in the sludge.
7 So, I am asking you how often do they
8 test the sludge on site from where it originates? How
9 often is that sludge tested?
10 A Let me address your first comment. Again,
11 Tony Behun's death is a tragedy. We, the report that
12 you read there is our report, and I again make the offer
13 to anybody that has additional information to please
14 sit down with us and share it with us.
15 Now, the EPA report that you referenced
16 does indicate that sludge, raw sludge, can carry that
17 staph bacteria. But there is an important distinction
18 to be made here and that is that EPA's report relative
19 to raw, untreated sludge and not biosolids. In that
20 Tony was exposed to biosolids, and I think it is important
21 to keep that distinction forward. Having said that,
22 again, anybody that has additional information I encourage
23 them to share it with us and we are most interested
24 in getting at the truth.
25 In regard to your question about testing,

1 I will ask Tom to address that.

2 MR. SWEENEY: The monitoring frequencies

3 of our regulations are based on volume that the facility

4 generates and land applies. So a large municipal wastewater

5 treatment plant we test biosolids at a minimum of once

6 a month. Now that testing we require be representative

7 of the material that they generate that month. In our

8 training courses we teach land generators how to collect

9 representative samples. Some facilities may only have

10 to test once a year. These are typically small municipal

11 wastewater treatment plants with very small flows through

12 industrial inputs.

13 BY REPRESENTATIVE SURRA: (To Mr. Lauch)

14 Q So, the large ones have to do it once

15 a month. This will be a yes or no answer, Mr. Chairman.

16 I beg your indulgence. So in other words, if stuff

17 is not treated properly, that pathogen may very well

18 have been present in that supposedly biosolid sludge?

19 They only test it once a month.

20 A Can I just add something here?

21 Q Yes or no, I don't want to delay.

22 A Wastewater treatment plant processes

23 are very stable. They are very consistent and the

24 representative sampling that we do is to confirm that

25 the treatment process is continuing to function. So

1 that you don't have to test every mode of biosolid that
2 is generated. The process is stable.
3 Q You just don't take sludge and dump it.
4 You treat it I thought I heard you say.
5 A That is right.
6 Q If the stuff does not go through the
7 treatment is it possible that that contaminant or that
8 bacteria was present in that sludge; yes or no?
9 A It would not be a situation where the
10 waste materials wouldn't go through the treatment plant.
11 REPRESENTATIVE SURRA: Thank you.
12 CHAIRMAN BUNT: Thank you, Mr. Surra.
13 I think we have one more question. It is very difficult
14 as Chairman to deny anybody an opportunity to ask a
15 question or get information. It is the most difficult
16 position I have ever been in, but we need to keep to
17 a time schedule. Mr. Ross, Chester County.
18 REPRESENTATIVE ROSS: Thank you very
19 much for recognizing me. I have a considerable amount
20 of interest in this and some questions. I see we are
21 well past the time we are allotted, so I will also submit
22 my questions in writing. Thank you for your indulgence.
23 CHAIRMAN BUNT: Thank you. The second
24 individual to testify is Dr. Richard Stehouwer, Assistant
25 Professor, Soil Chemistry, Penn State University.

1 Dr. Stehouwer, if you are ready, please start.
2 DR. STEHOUWER: Thank you, Mr. Chairman.
3 I was asked to present testimony on research that I
4 have conducted in Pennsylvania that relates to land
5 application of biosolids or treated sewage sludge. I
6 joined the faculty at Penn State in August, 1997. My
7 appointment is as a state extension specialist in
8 environmental soil and also have a research complement
9 to my appointment.
10 But when I arrived here, it was apparent
11 that there were a lot of questions about sewage sludge
12 and lime application. So I did begin some research
13 projects in the area.
14 The first one I initiated was a survey
15 of all the analytical data that I could obtain on sewage
16 sludge and I will present the results of that survey this morining
17 It will be involved in my testimony.
18 I also began a study looking at farms
19 where sewage sludge has been applied, several times
20 sampling soils and crops grown on these soils.
21 The third study that I have begun is
22 looking at specifically alkaline stabilized biosolids
23 that can be used as a lime substitute for alfalfa production.
24 A fourth one is looking at the use of
25 biosolids in mine reclamation, specifically looking

1 at the quality of water generated at a mine site reclaimed
2 with biosolids.
3 Now, these four projects, the first one is
4 the only one that is completed. The second two projects
5 are three-year studies and they are in their second
6 year and the fourth is just beginning this spring. I
7 will just very briefly describe those projects, but
8 I will only present detailed information about the first
9 survey. There is two reasons for this first. I am
10 reluctant to present speculative results from research
11 that is not completed. And second, I think the results
12 of the survey analytical data of sewage sludge has a
13 direct bearing on the matter of the need for testing,
14 additional testing for land applied biosolids.
15 The second project I mentioned -- effects
16 of land applied biosolids on soil and crop quality.
17 What we are trying to do in this project is look at
18 soils where biosolids have been repeatedly applied,
19 looking at samples of those soils. We are doing this
20 on 20 farms all around the state. It is being done
21 actually in 18 different counties. It is a cooperative
22 effort between myself and the county extension agents
23 in each of these counties. Each cooperating agent has
24 located a farm in their county where biosolids have
25 been applied. And each of these farms we have identified

one field where biosolids have been applied and a second field where they have never been applied. We have samples each of those fields, soils and crops and analyzing those materials for the parameters I have listed here and will use these data to determine what effect these biosolids have had on those parameters.

The effects of alkaline stabilized biosolids on alfalfa production and quality. This recent project, as I mentioned, is looking at the use of these alkaline stabilized materials as they substitute for agricultural limestone to determine if it is effective that way. We're also looking at specifically at copper and molybdenum both in the soil and the alfalfa tissues. There is some concern because if the ratio of copper and molybdenum in the forage that is grown drops too low, it could cause a dietary problem for cattle that feed on that forage known as molybdenosis, and so we are looking at the effects of this material on copper and molybdenum in the forage. The last one I want to mention is the use of biosolids in mine reclamation. What we are doing in this project, we have identified an abandoned mine site which is going to be reclaimed with biosolids approximately one year from now. Just this past month or this past week we have begun installing surface water collection devices, lysimeters, which collects (inaudible)

1 water until it passes down through and also shallow
2 groundwater wells. We will monitor the water at the
3 site from now until the biosolids are applied next spring
4 and then we will continue monitoring after that for
5 a period right now about 12 months after that. Hopefully
6 we will be able to obtain additional funding to continue
7 monitoring for a longer period.
8 I would like to spend most of my time
9 I mentioned talking about the sewage sludge survey that
10 I conducted. And to do this I think it is best done,
11 because I will be showing a lot of numbers and perhaps
12 use the overhead projector. So this study was one I
13 initiated after I came to the state. The survey actually
14 covers the period from 1978 to 1998, a 20-year period.
15 I was able to assemble some 7,740 analytical records
16 of sewage sludge analyses that were conducted in
17 Pennsylvania from 177 different treatment plants, POTWs,
18 Public Owned Treatment Works. We have in this database
19 analytical data for nutrients, organic nitrogen, amonium,
20 phosphorus, potassium, calcium, magnesium and also all
21 the regulated trace elements that you heard mentioned
22 earlier, arsenic, cadmium, chromium, copper, on down
23 to zinc.
24 We also have categorical data on the
25 treatment plants. Sludges are part of the database.

1 We sent out surveys to all of the treatment plants and
2 obtained information such as the size of the treatment
3 plant, the type of treatment processes they used in
4 the plants, how much biosolids they produced in a year,
5 how much is land applied, information such as that.
6 I have looked at this data in many different
7 ways. One of the first things I did was to divide all
8 the records by year and look at the distribution of
9 concentrations of nutrients and trace metals in the
10 sludges and then clock those by year. Look at the range
11 of concentration to see how they changed in the state
12 as a whole during the span of years covered by the survey.
13 Just a couple asides here. This data
14 I have written up as a scientific journal article that
15 has just been accepted for publication in the Journal
16 of Environmental Quality that should appear in a month
17 or two. If any of you would like a copy of that manuscript,
18 contact me. I would be happy to provide that for you.
19 I'm not going to show you all the data
20 this morning. We don't have time for that. I did
21 distribute a pamphlet, an extension pamphlet, that contains
22 some of this data for a number of the trace elements.
23 I am just going to show you lead as an example here
24 this morning. What we are looking at is the span of
25 database that I have from 1978 to 1996. And what is

1 plotted here are percentiles. We have the 25th percentile,
2 the median which is the 50th percentile, 75th percentile
3 and the 90th percentile that gives you an indication
4 of the distribution of lead concentrations in sludges
5 in Pennsylvania. During this year, 1978 for example,
6 the 25th percentile indicate the concentration that
7 25 percent of the analyses was less than, 75 percent
8 was greater than the median, the 50 percentile is a
9 halfway point and the 75th percentile is 75 percent
10 less than 25 percent greater than.
11 So what you see here over this 20-year
12 span is that there is a downward trend in the concentrations
13 of lead in the sewage sludges that were analyzed. The
14 median concentrations have trended downward. Also,
15 the range of the data from the 25th percentile to the
16 75th percentile is known as the interquartile range.
17 The width of that range also becomes less. It has shrunk
18 over this 20-year period and those sludges with the
19 highest concentrations of lead have also decreased quite
20 substantially over this 20-year period.
21 I want to point out also though that
22 in the last five years of this database, these points
23 here with open circles and a separate line, you will
24 note in the last five years the downward trend has
25 apparently stopped or slowed substantially. So it

1 appears that at least with lead there has been a leveling
2 off in this downward trend. But you will note back
3 in the late '70s, early '80s our median lead concentrations
4 were up around 300. Currently they are down to around
5 60 parts per million.
6 As I mentioned, I am not going to show
7 you all of these figures. You can find them in that
8 extension fact sheet entitled "Biosolids Quality." But
9 here are just the regression coefficients for a number
10 of the trace metals. You can see that the overall trend
11 for these is similar. Anywhere where you see a negative
12 sign in front of a value, for cadmium it means it declined
13 significantly during that 20-year period. The interquartile
14 range became less, and the 90 percentile became less.
15 So over the 20-year period these trace elements decrease
16 in their concentrations in the ranges and in the 90
17 percentile.
18 As I mentioned before, if you look at
19 just the last five years, you will note that there is
20 a leveling off. Anywhere where you see NS it means
21 there is a downward trend and it is no longer significant.
22 It is not different from zero. In other words, you
23 can't say it is increasing or decreasing. Where you
24 see these negative values it is still decreasing during
25 this last five years, but if you compare these numbers

1 the size with the corresponding numbers for a 20-year
2 period you see they are smaller indicating that there
3 has been a slowing. So they dropped and now we are
4 tending to level off.
5 Arsenic, molybdenum and selenium are
6 not on here. That is because we did not have enough
7 data on those elements in the database before 1993 to
8 do this type of analysis. From '93 to '97, however,
9 they have not changed in their concentrations in the
10 sludges.
11 I think the main reason for these decreases
12 in concentrations of these trace metals is due to the
13 imposition or institution of industrial treatment programs
14 which is a system whereby industrial contributors to
15 the municipal wastewater flow have to meet standards
16 of what materials, metals, pollutants they are allowed
17 to discharge into the municipal wastewater system. So
18 as those concentrations drop, consequently, we have
19 seen a decrease in the metals in the sewage sludges.
20 Another way to look at these data, these
21 sort of overall statewide data, is to just compare them
22 to DEP's regulations and federal regulations. I have
23 done that in this table comparing them to the exceptional
24 quality sludge standards that you heard about in the
25 previous testimony and as given in this third column.

1 These are the more stringent numbers in the regulations.
2 In the first column it is the median concentration for
3 each of the trace metals. In the second column is the
4 90th percentile concentration. In other words, 90 percent
5 of all the sludges in the database for this year, 1997.
6 Ninety percent of them were less than this value. Ten
7 percent were above that value. If you compare these
8 column, and the center column with the final column
9 you will see in every case the values are less than
10 the exceptional quality number.
11 So essentially what this says is most
12 of the sewage sludges generated in Pennsylvania would
13 be able to qualify as EQ sludge on the basis of the
14 metals. The reason that they are not is due to the
15 pathogen reduction standards that they either do or
16 do not achieve.
17 Another way of looking at these numbers
18 is to do some calculations with them and determine how
19 many applications of these materials would be required
20 to reach the cumulative loading limit. This is the
21 limit that the regulations have placed on how much of
22 these metals may be added to the soil before any further
23 addition needs to be stopped. Using a median concentration
24 and a five-ton rate, application rate, which is typical
25 for agricultural application, the number of applications

1 to reach the cumulative limits for each of these metals
2 or trace elements is listed in the final column. And
3 you can see that these numbers are quite large. The
4 five-ton per acre rate would be a normal annual application.
5 So roughly, you could translate this into years of
6 application assuming this were done every year. The
7 limit first would be reached for copper based on our
8 1997 sludges followed by lead after some 440 applications
9 followed by zinc than by lead. The others would require
10 considerably more applications.
11 The one message here is that, first of
12 all, they do not all build up at the same rate in the
13 soil. Do not approach their limit at the same rate.
14 And also copper, zinc and lead possibly are the metals
15 that we should be paying close attention to.
16 Some conclusions from this part of the
17 study. There have been significant decreases in trace
18 element concentrations in Pennsylvania sewage sludges
19 over the past 20 years. I would attribute these decreases
20 primarily to industrial pre-treatment programs.
21 I didn't show you this data, but there
22 are, based on the sewage plant survey indicating treatment
23 plant size, percent industrial contribution and so on,
24 I could not consistently separate out any differences
25 in metal concentrations from treatment plants of different

1 sizes or different percent industrial contributions
2 to their overall flow.
3 Almost all of Pennsylvania sludges do
4 have trace element concentrations that are below the
5 exceptional quality limits.
6 And for most of the sludges copper is
7 going to be the metal that will ultimately limit land
8 application under our current regulations and under
9 the current sewage sludge copper concentrations.
10 I wanted to go a little bit farther with
11 this data and use it to look at questions of variability,
12 both of nutrients and trace metals. How much variability
13 do we see within a treatment plant and how much error
14 could that lead to in determining nutrient applications
15 as well as determining these trace elements cumulative
16 load?
17 So, as you have heard before, annual
18 applications of sewage sludges are based on nitrogen
19 and the agronomic needs, nitrogen needs of the crops
20 that are going to be grown in that field. Long-term
21 applications at any given site is limited by this cumulative
22 loading of these eight trace elements; arsenic, cadmium,
23 copper, mercury, lead, nickel, selenium and zinc.
24 So the question I want to get at is how
25 much uncertainty is associated with determining these

1 limiting factors. Now the way I did this, the approach
2 I took was to take a subset of the overall database.
3 I wanted to look at the last five years because that
4 was a period where things have appeared to level off,
5 stabilize, where there was not an overall change in
6 the metals. And also I thought it would be good to
7 look at more recent numbers to see, you know, to look
8 at where we are today. So what I did was on the database I
9 pooled all the treatment plants that I had at least 20
10 records for from the period of '93 through '98. From
11 that group of treatment plants I then selected 12 treatment
12 plants that gave me kind of a range of treatment plants,
13 a ranking in size from very large to very small treatment
14 plants that applied, land applied a significant portion
15 of their biosolids and then also treatment plants that
16 represented a variety of treatment methods.
17 So here are the 12 plants that I ended
18 up with. You can see the range in capacity from less
19 than one million gallons per day of wastewater treated
20 up to 440 million gallons a day of wastewater treatment.
21 The biosolids generated ranges from 115
22 dry tons per year up to 60,000 dry tons per year. We
23 have the three main treatment processes, sludge treatment
24 block processes also represented in these 12 treatment
25 plants.

1 The way I went about assessing the
2 application uncertainty, I am not going to go into a
3 great detail on this, but I think I used a method that
4 was realistic and also conservative in that if anything
5 it would tend to overestimate uncertainty. From the
6 nutrients, nitrogen in particular, for each treatment
7 plant I first determined the amount of biosolids that
8 would be needed to supply 130 kgs available nitrogen
9 per hectare. That is approximately equal to pounds
10 per acre. A typical application rate for a corn crop.
11 That was based on the mean, the average organic nitrogen
12 and ammonium content in the sludges produced at that
13 treatment plant.
14 To estimate the uncertainty or the possible
15 application error, I looked at the variability of the
16 nutrients and used twice the standard deviation as an
17 estimate of the variability. Two times standard deviation
18 would capture approximately 95 percent of all the data
19 points.
20 For the trace elements I again used the
21 application rate that was determined here for the biosolids
22 and then estimated the cumulative loading uncertainty
23 by taking the overall range that I saw in a five-year
24 period. The lowest concentration compared to the highest
25 concentration over a five-year period times the application

1 rate to estimate possible error.

2 This just shows you the kind of variabilities
3 that you see at an individual treatment plant over this
4 five-year period. We did about 60 different analyses
5 for organic, nitrogen, phosphorus and ammonium. And
6 the dotted line here shows plus or minus two standard
7 deviations. And so this range here is my estimate of
8 error. And so for example if the plant were to be using
9 this value here as their nitrogen value and was actually
10 applying this material, you can see there would be a
11 shortfall. They are overestimating the amount of nitrogen
12 being applied. Or if they were using this value and
13 applying this material, there would be an underestimation
14 of how much nitrogen is being applied. So my goal is
15 to determine how big is that error at each of these
16 12 different treatment plants.

17 So for the 12 treatment plants this is
18 the application rate, the amount of biosolids that would
19 need to be applied to get this 130 kilos of nitrogen.
20 That is metric tons per hectare. If you divide that
21 by approximately two, you will get close to tons per
22 acre.

23 Here are the error estimates using two
24 times standard deviation. Again, in kgs per hectare.
25 It is again close to pounds per acre. This is the total

1 of adding organic and ammonium. And this is the percent
2 of that error expressed as a percentage of what we are
3 wanting to get, a percentage of the 130 kilos.
4 You can see that the error is fairly
5 substantial. In some cases we are over 100 percent
6 error. In others we could possibly be applying twice
7 as much nitrogen as we thought we were. In other cases
8 it is much lower, down around 30, closer to 40 I guess
9 are the lower ones.
10 I do need to emphasize that this is an
11 estimate of a maximum error that you could see based
12 on the variability from each of these plants. In actual
13 practice most of these plants use a rolling average
14 of the last three analyses. So that would dampen some
15 of this uncertainty estimation, but nevertheless there
16 is certainly some potential for either over application
17 which could lead to some possible problems in terms
18 of leaching of nitrates or under application, which
19 in this case the farmer would not be getting the nitrogen
20 that he was counting on.
21 To put this in the context I thought
22 it would be good to compare this to variability that
23 we see in manures. I did the same type of analysis
24 with several different data sets, different types of
25 manures. And you can see that, again, we have very

1 substantial possibilities for error in nitrogen loading
2 determinations with manures. In fact, overall they
3 are greater than the biosolids. Again, in actual practice
4 manures are rarely analyzed for nutrients. So there
5 is probably in actuality a much greater possible error
6 with manure application.
7 But the fact remains that, I think we
8 probably could do a better job of measuring nutrients,
9 nitrogen in particular, in biosolids. Perhaps linking
10 testing of nutrients more closely with particular material
11 that is going to be land applied.
12 I would like to shift now to variability
13 in trace elements. Again, I will use lead as an example.
14 This is the type of variability again at a single treatment
15 plant over this five-year period. The variability you
16 see in lead. Again, we are looking at values that range
17 from about 25 parts per million up to a high of about
18 85 parts per million. And the way I estimate the application
19 uncertainty is to take this overall range here, the
20 lowest actually is over here, about 23 parts per million
21 versus this particular one. So I took this range as
22 the maximum possible error.
23 So here are the resulting estimates,
24 error estimates, for each of these 12 treatment plants
25 that could result from the analyses that I have records

1 of. Again, this is the application rate. This is the
2 amount of lead added given this application rate and
3 using the average lead concentration in the soil in
4 the biosolids. And here are the maximum error estimates.
5 This would be the error associated with the variability
6 of that particular treatment plant, the application
7 rate. You can see it ranges from .22 kilos per hectare
8 up to 3.48.
9 If we take these values, if you compare
10 them to what we would calculate were applied, you can
11 see again they could be off by quite a bit. But we
12 really should apply -- compare these estimates of error
13 to our cumulative loading limit. That is the target
14 that we are shooting for. You express these errors
15 as a percent of the cumulative loading limit. You can
16 see as a percentage ranging from about .07 up to just
17 over one percent. So, compared to the cumulative loading
18 limit these errors are really very small. We also need
19 to recognize that these errors could be either positive,
20 overestimating, or negative, underestimating the amount
21 of lead that is being applied. So over several applications,
22 I mentioned it would probably take a couple of hundred
23 applications, the small, positive and negative errors
24 would probably cancel each other out. So we would not
25 get far off our cumulative loading tracking.

1 These are just the data for the other
2 metals. The average for the 12 treatment plants. Here
3 is the application error. Here is the percent of cumulative
4 loading. I took the maximum error of each of the 12
5 that is given. Here is the maximum error and the maximum
6 error as a percent of the cumulative loading limits.
7 Again, most of the maximum errors are less than one-
8 half percent, again, with the exception I have already
9 showed you of lead.
10 The conclusion I reached from analyzing
11 these analytical data, there is potential given the
12 variability we see in biosolids nitrogen content. A
13 potential for significant over or under application
14 of the nitrogen. Again, I didn't go into this detail,
15 but variability in ammonium concentration actually accounts
16 for a greater portion of the uncertainty than does the
17 organic nitrogen. Biosolid nutrient content uncertainty
18 is also less than we see in manures. And I believe
19 some improvement could be made in nitrogen management
20 with biosolids if we were to more closely link analysis
21 for nutrients for nitrogen particularly with the
22 application of material that is prepared for land applica-
23 tion.
24 And finally, with respect to trace elements,
25 again, I didn't touch on this in my testimony but

1 variability within a treatment plant, I mean, between
2 treatment plants is generally larger than within a treatment
3 plant. So, a lot of the variability we see statewide
4 is treatment plant to treatment plant variability. There
5 is less variability within the given treatment plant.
6 Uncertainty in the biosolids trace element
7 concentrations generally result in less than a half
8 percent error in determining cumulative loading limits
9 for most of the trace elements. And these data indicate
10 that increasing the frequency or intensity of biosolids
11 trace metal analyses is not going to improve on the
12 accuracy of cumulative loading calculations.
13 I apologize for some of the extensive
14 numbers I have shown you. I hope I have explained the
15 approach adequately. That will conclude my testimony.
16 CHAIRMAN BUNT: Thank you, Dr. Stehouwer.
17 BY CHAIRMAN BUNT:
18 Q One of the arguments that we often hear
19 is that with testing at the plant by the generator there
20 is usually a disconnect or an allegation of a disconnect
21 between that testing and the actual site of application.
22 Now the concern being that the test results at the plant
23 would not be mirrored in the field. Are you aware of
24 any research being done along these lines? If not,
25 do you think that a project of random sampling and

1 testing at the point of application would be worthwhile?
2 A I am not aware of any study, large scientific
3 study that has been done to compare testing results
4 at the treatment plant versus testing of biosolids as
5 they are delivered at the field. I could be wrong.
6 I don't know everything about this. I am not aware
7 of any.
8 The second part of your question, could
9 you repeat it? I have forgotten it.
10 Q The second part, are you aware of any
11 research being done?
12 A Currently being done, I am not aware.
13 Q Do you think a project of random sampling
14 testing at the point of application would be worthwhile?
15 A I guess it would be. I think it could
16 be worthwhile if it were done correctly. It would need
17 to be done carefully. The sampling would have to be
18 done following proper scientific methods. Analyses
19 would have to be done using standard methods. You would
20 have to have extensive control over every step of the
21 way to ensure integrity of sampling and sample analysis
22 and data analysis. If there are in fact concerns that
23 the variability, the variability of the treatment plant
24 is so great that we don't know what is going on in the
25 field, is that the concern, we could compare the

1 variability we see in the field versus the variability
2 we see in the treatment plant and see if they align
3 with each other or not.
4 CHAIRMAN BUNT: Thank you. Questions,
5 Mr. Masland.
6 REPRESENTATIVE MASLAND: I really hesitate
7 to ask a question because I feel I have been blown away
8 by the numbers already. But a lot of times we say I
9 think and it is okay when we say I think, but when a
10 scientist says I think, it makes me worry. They are
11 supposed to say these are the facts.
12 BY REPRESENTATIVE MASLAND:
13 Q The first part on the metals distribution
14 you said I think these decreases can be attributed primarily
15 to the implementation and enforcement of industrial
16 and treatment programs. You use that in your conclusions.
17 But you don't have any data. Not that I think we need
18 a whole lot more data. But were there studies to show
19 that that has in fact taken place so that you could
20 draw that conclusion with respect to those metals
21 distributions?
22 A Well, the decrease coincides with limitation
23 of industrial treatment programs which target these
24 specific metals. I don't have data that shows a decrease
25 in metals coming into the plant in the wastewater.

1 But knowing that, there seems to be pretty strong
2 correlation there between the metals that have been
3 targeted and the industrial pre-treatment programs at
4 the same time you see this decline in the metals in
5 the sludges.
6 Q Which means it's a predominant factor not
7 to say there aren't any other factors involved?
8 A Right. I would draw that conclusion.
9 CHAIRMAN BUNT: Mr. Levdansky.
10 Mr. Levdansky waves off. Mr. Stern
11 from Blair County. Sara Steelman, Indiana County.
12 REPRESENTATIVE STEELMAN: Thank you,
13 Mr. Chairman.
14 BY REPRESENTATIVE STEELMAN:
15 Q I have a question. We have been hearing
16 a good deal about the calculations of the cumulative
17 loading. But there don't seem to be any studies of
18 what actually happens when the sludge is applied to
19 a field. Now you describe what looks like a very interesting
20 comparative study of fields on farms to which sludge
21 has been applied historically and to which sludge has
22 not historically been applied. But there you are already
23 starting with a situation in which the sludge has been
24 applied for some historic period of time. At some point
25 I think we will be very interested in seeing the results

1 of that study. You comment it is only research in progress
2 at this stage. But do you know any studies that have
3 actually measured cumulative developments in the various
4 measured elements as a result of sewage sludge application
5 and has there been any attempt, if such studies were done,
6 has there been any attempt to look at differences in
7 the soil chemistry that may mediate differences in
8 accumulation. Every gardner knows that clay soil, loam
9 soil and sandy soil respond differently to the things
10 we do to them in the backyard. How does that play out
11 in looking at biosolids application?
12 A The first part of your question, there
13 are many studies in the scientific literature where
14 build up of metals from zero with application of sludges
15 have been tracked. So that information is certainly
16 available and this has been done in many different soils
17 all around, not just the United States, all around the
18 world. So there is a lot of information preparing different
19 soil types, sludges, metals from various sources and
20 various types of soils. And yes, you are correct, metals
21 behave differently in different types of soils. The
22 relative availability of those metals. A lot of the
23 work with sewage sludges is indicated that the sewage
24 sludge itself has a very dominant role in the overall
25 chemistry of the trace elements.

1 Q And the very dreaded follow-up question.
2 Who could perhaps provide the Committee with a summary
3 of those studies so that we might have a better under-
4 standing of what historical scientific record has to
5 tell us?
6 A There are a number of already published
7 scientific reviews of scientific literature that would
8 be available. There is, I don't think we want to look
9 at, but the technical support documentation from the
10 development of the federal 503 regulations would also
11 cite numerous papers.
12 REPRESENTATIVE STEELMAN: Perhaps if
13 you could share some of those records with Committee
14 staff we would be able to get access to them. Thank
15 you.
16 CHAIRMAN BUNT: Thank you. Mr. Ross.
17 REPRESENTATIVE ROSS: Thank you, Mr.
18 Chairman.
19 BY REPRESENTATIVE ROSS:
20 Q Doctor, forgive me, but I was never very
21 good at science. So I am going to ask kind of a basic
22 question. Heavy metals and pathogens sound pretty scary
23 to a layperson. And I was wondering if they could be
24 found in the soil for any other reason besides sludge
25 application?

1 A Well, soils have a natural background
2 level of all of these trace elements that are regulated.
3 They are there to begin with. And with regard to pathogens,
4 I am not a microbiologist or pathologist so that is
5 out of my realm of expertise. Obviously, there are
6 other sources of pathogens than sewage sludge. So,
7 I am sure they are there from other sources. Does that
8 answer your question?
9 REPRESENTATIVE ROSS: Yes. Thank you
10 very much.
11 CHAIRMAN BUNT: Mr. Surra.
12 BY REPRESENTATIVE SURRA:
13 Q Thank you, doctor. I wish I could say
14 that I understood all your numbers. I think a lot of
15 this boils down, and I don't question your ability to
16 science. I mean, a lot of this boils down to trust
17 and it requires when you do have sludge, it requires
18 testing and treatment and preparation before it can
19 be land applied.
20 Now the Department testified that the
21 largest treatment plants, that they only require testing
22 one time per month and less at smaller plants. And
23 there is basically little or no testing on site once
24 it is land applied by local government. Now earlier
25 you heard me say that I personally witnessed and was

on a site where there was sewage sludge applied and had pieces of transformers, cement block and electronic pieces in it. And I don't know anybody that flushes that stuff down their toilet. But maybe you can explain how you think that got in there. And do you think that -- maybe we should have some additional random testing prior to leaving the treatment facility that treats it so it could be land applied? So we know what is being put down. Would you think it would be a good idea to allow local government the ability to occasionally test what is being applied at a site to put people's fears to rest? How can you explain sludge having pieces of transformer in it? Would you support additional testing when it leaves the facility and possibly by local government when it arrives at a site?

A I believe the testing that is done at the treatment plant with respect to trace elements is adequate to characterize that material. I can't really comment on what you say you saw at an application site, what you saw. Obvious foreign materials that should not have been in that sludge if they were -- if in fact they arrived in the sludge or not. I would guess that the issue of testing material at the site, that gets to be a very political question I think. And as a scientist I don't really want to comment on that directly.

1 Knowing what is leaving the plant, I'd guess unless
2 there is evidence that materials, other materials are
3 being added to the sludge before it gets to the treatment
4 site or the application site or if other materials are
5 being applied at the treatment site in addition to the
6 sludge, then obviously, that needs to be followed up.
7 In terms of the sludge itself, I think
8 the testing that is done at treatment plants, again,
9 with respect to the trace metals, I think that adequately
10 characterizes that material.
11 CHAIRMAN BUNT: Chairman George.
12 REPRESENTATIVE GEORGE: Thank you, Mr.
13 Chairman.
14 BY REPRESENTATIVE GEORGE:
15 Q How do you pronounce your name, Stehouwer?
16 A Stehouwer.
17 Q Would you like to see that commode that
18 that piece of transformer came through; wouldn't that
19 be something?
20 A Yep. If in fact it did.
21 Q Doctor, do you know what a colleague
22 in the same profession as you are in by the name of
23 Dr. Stanley Thacket (phonetic) from Indiana University?
24 A I have heard his name. I do not know
25 him personally.

1 Q This gentleman did years of study on
2 sewage sludge. You are aware of that?
3 A I know he has done some, yes.
4 Q Now he insists that neither Heinz nor
5 Campbell's or Hunts will buy a food stuff processed
6 or grown on strewn lands of sludge. Is he accurate
7 in that assessment?
8 A As far as --
9 Q Is he accurate in that assessment or
10 is he full of malarky? Is he full of the same stuff
11 we are talking about?
12 A I think he is probably accurate. I have
13 heard that these food processors have made that statement.
14 Q Now, some of these tests you conducted,
15 you conducted them all or has the waste plant conducted
16 some of them?
17 A Approximately 80 percent of the analysis --
18 Q Have they conducted some of them?
19 CHAIRMAN BUNT: Just answer the question
20 as to your testimony. You can't answer the question
21 for somebody else. The question should be directed
22 of what testimony you provided. You don't know. You
23 can't answer a question about somebody else.
24 REPRESENTATIVE GEORGE: Mr. Chairman,
25 how do you want me to ask it?

1 DR. STEHOUWER: I can respond --
2 REPRESENTATIVE GEORGE: How do you want
3 me to ask it?
4 CHAIRMAN BUNT: I want you to be fair
5 with the witness.
6 REPRESENTATIVE GEORGE: I am being fair.
7 He was paid for that study and I am trying to learn
8 what he learned.
9 CHAIRMAN BUNT: Well then ask him the
10 obvious question. Who paid for the study if that is
11 what you want to find out. That is a fair question.
12 But don't ask him a question about what a colleague
13 knows that he doesn't even know the colleague. That
14 is not even a fair question of this witness.
15 REPRESENTATIVE GEORGE: Mr. Chairman,
16 you are very lucky there isn't thousands of people watching
17 this procedure.
18 CHAIRMAN BUNT: I would think there are,
19 Mr. Chairman.
20 BY REPRESENTATIVE GEORGE:
21 Q I ask you again --
22 A I can respond to your question.
23 Q Did you conduct all of the studies? Did
24 you take all the samples?
25 A Approximately 80 percent of the analyses

1 were done at the Ag Analytical Services Laboratory at Penn
2 State University. The remaining 20 percent, I obtained
3 the analytical results by going to the DEP regional
4 offices and getting analytical data out of their files
5 on the various land application sites. And some of
6 the data came directly from the wastewater treatment
7 plants.
8 Q Sir, how long do these pathogens survive
9 in sewage sludge; definitely, indefinitely?
10 A Again, I am not a microbiologist or a
11 pathologist. That is not in my area of expertise.
12 Q Do you think honestly there is any way
13 that we can make things safer? Can we reduce the level
14 of either metals or pathogens at the plant?
15 A Well, there are definitely ways of reducing
16 pathogens. We have heard testimony this morning already
17 of two different levels of pathogen reduction. So,
18 yes, there are ways of reducing pathogens.
19 Q Now you admit, even though everyone that
20 you deal with could be honest, there are some that might
21 add materials to already tested sludge that could be
22 harmful to those in our society that you know nothing
23 about, additions?
24 A Well, that would be a very speculative
25 answer, sir. Of course, anything is possible but I

1 have no knowledge of it.

2 REPRESENTATIVE GEORGE: I thank you,

3 professor. I thank you, Mr. Chairman.

4 CHAIRMAN BUNT: Thank you, Mr. Chairman.

5 Certainly if we ever get to any random testing, we ought

6 to impose some very, very harsh penalties on anyone

7 who contaminates a product after it has been tested.

8 DR. STEHOUWER: I would agree with that.

9 CHAIRMAN BUNT: Mrs. Rubley, Chester

10 County.

11 REPRESENTATIVE RUBLEY: Thank you, Mr.

12 Chairman.

13 BY REPRESENTATIVE RUBLEY:

14 Q Just a very quick question, Dr. Stehouwer.

15 You have done extensive analyses on the metals in the

16 biosolids. Did your study, apart from your presentation

17 today, involve any organic compounds such as PCBs or

18 some of the chlorinated pesticides?

19 A They included a lot of PCB analyses.

20 I was not able to do the type of analysis of that data

21 looking at distributions because the vast majority of

22 the data, the results were nondetectable, below detection

23 limit. And the detection limit varied from one analysis

24 to another. So I really was not able to do anything

25 with those PCB results.

1 REPRESENTATIVE RUBLEY: Thank you.
2 CHAIRMAN BUNT: Mr. Vitali.
3 REPRESENTATIVE VITALI: Thank you, doctor.
4 BY REPRESENTATIVE VITALI:
5 Q I will restate what I said earlier, which
6 as a layman, I have some concerns in that you have sludge
7 which contains metals and pathogens and organic toxins
8 and so forth ultimately being placed on farmland which
9 produces the food that we eat. Do you think it would
10 have a scientific value if we either intermittently
11 or routinely tested the food, corn, wheat, whatever,
12 grown on soil where biosolids have been land applied?
13 And do you think it might have a scientific value to
14 test the soil itself after the sludge is applied and
15 do you think it would have a scientific value to test
16 the sludge treatment but pre-application perhaps to
17 study cumulative effect over the years, perhaps to catch
18 situations where, as has been suggested, sludge may
19 have entered the system sort of getting around the treatment
20 plant testing? Would it have a scientific value to
21 do that just to maintain the integrity of the food we
22 eat?
23 A Well, first of all, many scientific studies
24 of that type have been done and provide the underlying
25 basis for how the numbers, for limiting numbers of these

1 metals were arrived at when the federal regulations were
2 first developed. So those studies do exist. Studies
3 of relating metal concentrations in the soils by uptake
4 of metals in the plants.
5 And I mentioned earlier a lot of studies
6 also looked at build up of metals in the soils from
7 addition of these metals from various sources, sludges
8 included.
9 Q I'm not talking so much as to theory,
10 how it builds up, but maybe to enforcement in this particular
11 field. Does this particular food have a metal content?
12 Does this particular soil have metal -- not the theory
13 of how it accumulates over time in general on average,
14 but these 273 Pennsylvania sites or whatever they are,
15 does this site, does this food have a problem, does
16 this sludge have a problem? Again and again and again
17 so you don't have disbanded discharge into the system
18 where you don't have a particular problem in a particular
19 area. Does that have a value to sort of monitor on
20 a day-to-day basis to keep our food supply as it should
21 be?
22 A I currently am conducting a study somewhat
23 like you are describing which I mentioned in my testimony.
24 I identified 20 farms where we are looking at the
25 concentrations of metals in the soil and in the crops tissue

1 that are grown on that soil, comparing that to a similar
2 field that has not had a biosolid application. So we
3 are looking at are metals building up in the soil, are
4 they getting into the plant tissues and how does that
5 compare to an adjacent field where there has never been
6 sludge applied and how the metals compare in that soil
7 and how they compare in the tissues of the crops that
8 are grown in this field. You are talking about a broader
9 scientific study of sampling.
10 Q I am not saying scientific study. I
11 am saying a routine testing, monitoring of soils, of
12 crops, of foods, on a regular basis testing them. Not
13 to develop overall theories, but to see is this food
14 safe, is this particular soil pure enough. Do you know
15 what I am saying, day-to-day enforcement and day-to-
16 day monitoring to see if -- not to discover overall
17 conclusions, but just to make sure each day that truck
18 brings corn to my supermarket, that that corn on the
19 shelf doesn't have too much in the way of metals and
20 other things. That day-to-day, month-to-month, whatever
21 frequency is appropriate monitoring of soil and crops.
22 A Well, again, I would say the study I
23 am conducting would get a lot of questions. These are
24 sites that have had varying lengths of application and
25 we will be looking at those varying questions.

1 The broader question of routine ongoing
2 testing, the way the regulations were developed and
3 science is behind them, I think gives us pretty good
4 assurance that we are not going to have metals building
5 up in plant tissues.
6 The other issue there becomes prohibitively
7 expensive to do this type of testing routinely. They
8 are very expensive tests to conduct. Especially if
9 you start analyzing for organic, possibly organic
10 contaminants. I guess in thousands of dollars per sample
11 if you want to analyze it.
12 So, I guess the whole issue comes down
13 to one of cost benefit type of thing. All the information
14 indicates there is not a problem. Is there a need to
15 do intensive monitoring of an application site at a
16 cost of thousands of dollars per site?
17 Q Can we conclude from the fact that you
18 are currently studying this situation that we don't
19 know the answer to that yet?
20 A I think one of the main motivations for
21 this study was to in fact document what is going on
22 at actual application sites. Not the sites that are
23 carefully controlled in scientific studies but what
24 is actually happening in practice in the field.
25 CHAIRMAN BUNT: Mr. Taylor, counsel.

1 BY MR. TAYLOR:

2 Q Dr. Stehouwer, several members have asked
3 you about the possibility of pathogens in sewage sludge
4 and Mr. Vitali has asked now about the food products
5 that result from growing the fields where the sludge
6 has been applied. You were saying there were several
7 studies that have been done and been published on the subject.
8 I was wondering, it would be helpful to the Committee
9 if you could provide us with those studies or a list
10 of those studies that we could get to the members.

11 A Well, I was talking about metals more
12 specifically. I was not talking about pathogens. Again,
13 pathogens is really outside of my field of expertise.
14 I know there are some studies and literature about pathogens,
15 survival of pathogens, survival of the soil following
16 application and that type of thing. I could find those
17 and give you references. But again, it is not, I want
18 to emphasize it is out of my area of expertise.

19 Q We understand that, doctor. But since
20 you did mention there are some studies out there, if
21 you could help the Committee by developing a list of
22 what you feel would be the most significant studies,
23 we could take a look at them. It is something that
24 would be very helpful.

25 DR. STEHOUWER: Okay. I can do that.

1 CHAIRMAN BUNT: Representative Miller.
2 BY REPRESENTATIVE MILLER:
3 Q Just for clarification you mentioned
4 that copper is the most limiting mineral in your studies.
5 But yet from what I am thinking I am hearing as far
6 as your study on the alfalfa and the alkaline stabilization
7 of biosolids did I hear that you in fact are not looking
8 at the plant uptake of these trace elements or you are?
9 Because my question is is this copper limit based on
10 just loading or do you somehow factor in plant removal
11 of some of these trace elements?
12 A That was a couple of questions rolled
13 in there. First of all, the study that I was doing
14 or am doing with alkaline stabilizing biosolids, we
15 are looking at copper and molybdenum ratios. That is
16 one aspect of this study. The reason for that, as I
17 mentioned, is because if the ratio of copper to molybdenum
18 in the diet of ruined animals drops, again, there are
19 various numbers out there, but a typical ratio is two
20 to one. If it drops below two to one, the animal can
21 suffer a molybdenum induced copper deficiency in its
22 diet. That is easily overcome by giving the animal
23 supplemental copper. But the concern is that we don't
24 want to produce forage that has a copper to molybdenum
25 ratio less than two to one if that is the number we

1 choose. So that is why we are looking at copper and molybdenum.
2 The reason we are looking at particularly alkaline
3 stabilized materials because of the chemistry of that
4 which is a relatively high pH, the effect of raising
5 the pH in the soil that tends to decrease copper
6 availability and increase molybdenum availability. Even
7 though there is a lot of copper in the biosolids, its
8 uptake may be decreased because of the relatively high
9 pH. So that is why I am looking at this and others
10 also have conducted similar studies looking at this
11 question.
12 CHAIRMAN BUNT: Representative Miller
13 from York County.
14 REPRESENTATIVE MILLER: Thank you, Mr.
15 Chairman.
16 BY REPRESENTATIVE MILLER:
17 Q My question just follows up on that.
18 This calculation of the number of applications calculation,
19 is that a linear calculation based on the concentration
20 and the maximum cumulative loading?
21 A That calculation was done using the median
22 concentrations of all Pennsylvania sludges for the year
23 1997. So we just simply took that number and projectively
24 applied five tons per acre, every application is five
25 tons per acre, how many applications would it take

1 to reach the cumulative loading limit assuming that
2 we had a median sewage sludge. There is a range there
3 that I showed you. So depending on what is actually
4 being used, you could be either over that number or
5 under that number. Presumably over 300 years these
6 levels will change somewhat and probably come
7 close to that estimate.
8 Q But there is no factor put in there for
9 plant uptake?
10 A No, there is no factor at all put in
11 there for any removal. We are assuming everything stays
12 right there.
13 REPRESENTATIVE MILLER: Thank you.
14 CHAIRMAN BUNT: Dr. Bastian.
15 REPRESENTATIVE BASTIAN: No questions.
16 CHAIRMAN BUNT: Mr. Smith.
17 REPRESENTATIVE SMITH: No questions.
18 CHAIRMAN BUNT: Mr. Samuelson.
19 BY REPRESENTATIVE SAMUELSON:
20 Q Thank you for coming to testify today.
21 I just want to follow up a little bit on Representative
22 Ron Miller's question about the cumulative limits and
23 trying to get a handle on some of these numbers. In
24 the one part of your testimony you talked about the
25 lead concentrations in the wastes from a typical treatment

1 facility or one treatment facility you tracked over
2 five years. If I was hearing correctly, the lead
3 concentrations seem to be in the range of 50 parts per
4 million if I was understanding that correctly. What,
5 in your experience or through your studies, is that
6 a typical lead concentration for a single application
7 of a biosolid? And when you look at the soil overall,
8 what kind of concentrations are you looking at when
9 you determine that it has reached its limit when you
10 have reached the cumulative loading limit? In this
11 example you are estimating after 441 applications. What
12 kind of lead concentration is in that soil? What kind
13 of numbers are you looking at in determining that 441
14 applications?
15 A Theoretically if you were to apply the
16 cumulative loading amount of lead, the soil concentration,
17 assuming that all of the lead stays in the upper six
18 inches and there is no removal, it will reach 150 parts
19 per million in the soil. You can approach that calculation
20 a couple of different ways and actually if you take
21 into account that you are adding a very minute amount
22 of lead in a larger matrix of sewage sludge, it is actually
23 kind of diluting the effect of the sludge itself. So
24 actually the concentration problem would not get to
25 that 150 parts per million level after that number

1 of applications just because of the diluting effect
2 of the sludge itself. There may be some removal. But
3 if you are assuming there is no removal and you are
4 adding that much lead in the pure form, concentration
5 would go up to 150 parts per million.
6 REPRESENTATIVE SAMUELSON: Thank you.
7 I would appreciate if you would supply the Committee
8 with the cumulative levels you are looking at for copper,
9 lead and these other metals. And I will look forward
10 to the results of your ongoing research. Thank you,
11 Mr. Chairman.
12 CHAIRMAN BUNT: The court reporter needs
13 to change her paper so we will take a break.
14 (Brief recess.)
15 CHAIRMAN BUNT: We are back to order.
16 Counsel has a question yet for Dr. Stehouwer.
17 MR. OKO: Thank you very much, doctor.
18 BY MR. OKO:
19 Q Just two quick short questions. At a
20 previous presentation where you presented some of this
21 same material, after you mentioned the reason why Penn
22 State has this data was that over the last 20 years
23 Penn State was doing some of the testing for some of
24 the smaller sewage facilities around the state, meaning
25 the smaller facilities. Of the top five facilities,

1 the four or five facilities, the bigger facilities,
2 that have a lot of the sludge how much of that data, you said
3 20 percent of the data was not done by Penn State. But of the larger
4 facilities what percentage was done by Penn State and what
5 percentage are you relying on?
6 A I don't have an answer right off the
7 top of my head for that. The top two facilities, the
8 two largest ones, were not -- I don't think, I don't
9 believe that those analyses were done at Penn State.
10 They were done elsewhere.
11 Q And the second question, in Pennsylvania
12 when someone complains about sludge DEP sends out an
13 inspector to investigate the complaint. To you would
14 it make scientific sense for DEP to go out and collect
15 a test sludge sample when someone complains?
16 A I guess it would depend on what the complaint
17 is, what the complaint involves.
18 CHAIRMAN BUNT: Thank you very much.
19 I appreciate it. Dr. Herschel Elliott. Dr. Elliott
20 is a professor of Agricultural and Biological Engineering
21 at Penn State University.
22 DR. ELLIOTT: Thank you. I will say
23 good afternoon instead of good morning. I appreciate
24 the opportunity to address you on this important topic.
25 In the allotted time, what I hope to do is give you

1 a perspective of academic researchers who study the
2 health, environmental and agronomic impacts of land
3 application of biosolids. Besides being familiar with
4 land spreading in the Commonwealth, I am aware of the
5 national perspective on this issue since I currently
6 chair the academic committee of the National Biosolids
7 Partnership. The Partnership is a not-for-profit alliance
8 formed by the USEPA, the Water Environment Federation,
9 and the Association of Metropolitan Sewerage Agencies,
10 to promote safe and environmentally sound biosolids
11 management. My comments today are based on a presentation
12 that I gave recently at a conference sponsored by the
13 National Science Foundation.
14 I hope to provide you with some insight
15 into the disparity of opinions on this topic, and why
16 this long-studied topic continues to receive attention.
17 All of you have been around long enough to realize that
18 social reality is frequently divorced from scientific
19 reality. Logic is, after all, no match for fear. But
20 I would hope there is an underlying and pervasive
21 philosophy that public policies must be based on sound,
22 scientifically defensible arguments. Thus, I offer
23 my opinion of the mainstream scientific consensus on
24 this issue as a reference point for important decisions
25 that you must make and votes that you will cast in

1 future days.

2 The Standards for the Use and Disposal
3 of Sewage Sludge, 40 CFR Part 503, published in February
4 1993, provided much-needed national standards to encourage
5 regulatory uniformity for biosolids recycling and ultimate
6 disposal (USEPA, 1993). The regulations of the Commonwealth
7 were developed on the foundation of the Part 503 rule.
8 Thus, the extensive multimedia risk assessment of Part
9 503 also serves as the scientific underpinning of our
10 state regulations. So when I mention Part 503, I am
11 referring to the federal regulations on which our state
12 regulations were in fact based. The Part 503 policies,
13 as with any program of such enormous complexity, have
14 received both praise and criticism from the academic
15 community. It is impossible to circumscribe the view
16 of all academics on this issue. In fact, the view of
17 some is really irrelevant. So I limit the field of
18 academics to scientists and engineers who have studied
19 biosolids management through accepted principles of
20 scientific rigor. Moreover, I present my academic
21 perspective as one trained in environmental engineering
22 and familiar with research on the behavior of pollutants
23 in soil and aquatic systems.

24 We focus today on land-based recycling
25 of biosolids. This issue is not one unique to Pennsylvania

1 since the land is the ultimate repository for most waste-
2 water solids generated in the US. My immediate purpose
3 is to characterize the academic view of land-based biosolids
4 recycling with five statements. The first two points
5 describe the academic perspective itself; last three
6 are tenets of my own perspective. I conclude with some
7 personal thoughts about the diversity of academic opinion.
8 **THE ACADEMIC PERSPECTIVE**
9 **Academic scientists differ on how, not**
10 **if, land-based biosolids recyling should be practiced.**
11 While professional opinions vary widely,
12 I know of no "critical mass" of academics championing
13 the notion, based on scientifically defensible and peer-
14 reviewed arguments, that land application should be
15 banned. This would be in contrast, I believe, to the
16 prevailing opinion if ocean disposal were currently
17 practiced. The academic perspective is less polarized
18 than we sometimes appreciate.
19 Obviously, the adequacy of the Part 503
20 has been questioned by some researchers, the most notable
21 and respected being the group from Cornell University.
22 But even the executive summary of Cornell's Case for
23 Caution states: ". . .the authors do not suggest a
24 prohibition of land application; but rather significantly
25 more restrictive use" (Harrison et al, 1999). Of

1 course, a practice can be effectively banned by restrictions
2 that render it cost prohibitive (and this is the danger
3 of scientifically unsupported local ordinances). But
4 as I understand it, the most tangible outgrowth of the
5 Cornell position is that cumulative soil metal loadings
6 be restricted to roughly one-tenth the levels stipulated
7 by Part 503. For biosolids of present-day quality,
8 this likely translates into 20-30 years of application
9 for an individual site. The point is those seeking
10 an outright ban on land application at the local level
11 are out of step with the entire academic community.
12 **The academic perspective is fundamentally**
13 **different from that of the public.**
14 When it comes to the risks of beneficial
15 use, the academic view differs markedly from public
16 perception. The situation is quite similar to the divergent
17 views on nuclear power. Perhaps an appropriate comparison,
18 given our current proximity to Three Mile Island. In
19 a 1985 survey of various leadership groups, researchers
20 posed the question: Are nuclear power plants safe?
21 Affirmative responses of the various groups were:
22 Public interest organization leaders,
23 only 6.4 percent said yes, nuclear power plants are
24 safe.
25 Directors and producers of prime time

1 television, 13 percent.

2 Random sample of 929 scientists from

3 American Men and Women of Science, 60.2 percent said

4 yes they are safe.

5 Scientists in energy-related fields,

6 76 percent.

7 Nuclear experts, 98.7 percent felt that

8 nuclear power plants were safe.

9 Likewise the academic view is much more

10 favorable toward land application than that of the public.

11 Several reasons can be offered. Just as the public

12 view of nuclear power is biased by the association of

13 radioactivity with weapons of mass destruction, so the

14 perception of biosolids recycling is unalterably tied

15 to visceral reactions to human wastes. Public opinion

16 tends to be an echo of major print and broadcast media

17 that traffic in the sensational and seem to have a

18 penchant for public paranoia. Academics are suspicious

19 of shallow statements calculated to alarm. If a material

20 is reported to be "laced" with toxins, they want to

21 know what the contaminants are, their levels, and whether

22 such levels are even significant. Moreover, scientists

23 better appreciate that significant assaults on health

24 and the environment have occurred historically, not

25 because we have studied and then underestimated risks,

1 but because we have ignored risks. Finally, those in
2 academia are more aware that no activity is risk free,
3 and as repugnant as it is to some, that we routinely
4 make decisions that place a dollar value on human life.
5 For example, some tens of hundreds of
6 deaths occur at railroad crossings each year. These
7 deaths are totally preventable where we could simply
8 build an overpass every place a road or highway traversed
9 the railroad tracks. But we have chosen not to do this
10 because it would cost billions of dollars. In essence
11 we have said that the value of lives lost is not commensurate
12 with the cost of building such overpasses.
13 So people need to appreciate the fact
14 that just because a hazard is identified, it doesn't
15 need to spend dollars to eliminate the hazard.
16 Risk-based approach is the most appropriate
17 protection paradigm.
18 In a broad sense, there are basically
19 two ways of protecting the public and health from the
20 use of biosolids. One protection deems any detectable
21 adverse effect is unacceptable, essentially allowing
22 for "zero impact." This finds expression in guidelines
23 which do not permit soil metal levels from exceeding
24 background concentrations. Thus metal additions from
25 biosolids must balance those lost through crop removal,

1 leaching and erosion. This results in numerical loading
2 limits that are drastically more restrictive than Part
3 503 and would effectively eliminate long-term biosolids
4 application. The philosophy also translates in an attempt
5 to find and protect the most sensitive individual or
6 population subset within a community or ecosystem. For
7 example, in developing a risk scenario, someone suggests
8 that the pathogen requirements should be designed to
9 protect not the healthy individuals, but those who are
10 immuno compromised like AIDS patients or organ transplant
11 recipients. Or when considering soil ingestion as a
12 potential exposure route, rather than consider the upper
13 limit of what a normal child might consume, some feel
14 we should aim to protect pica children, those with an
15 abnormal desire to eat chalk and soil and other materials.
16 Or someone suggests that if we are guarding against
17 biotoxicity we choose the most metal sensitive crop
18 grown on sandy soils and acidic soils.
19 So some exposure scenarios can be dreamed
20 up that are just not consistent with normal farming
21 practices.
22 Well in contrast the Part 503 is a risk-
23 based approach and requires explicit definition of the
24 species, exposure pathways and quantitative, quantifiable
25 protection level.

A basic tenet of Part 503 is the explicit recognition that biosolids are a valuable resource. The overview of the Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule (USEPA, 1995) states: "The term biosolids is used in this document to emphasize the beneficial nature of this valuable, recyclable resource (i.e., the use of the nutrients and organic matter in biosolids as a fertilizer or soil conditioner). Also, it is important to point out that while many of the substances found in biosolids are called pollutants throughout the document, many also are beneficial elements that are essential for the growth of plants and animals."

"Zero impact" protection paradigms do not consider offsetting benefits and thus are unworkable and inconsistent with other public health policies. Case in point: we continue to use penicillin as an antibiotic despite the 400-800 deaths it causes each year in this country. Clearly, we have decided that 1-2 deaths per 10,000 patients treated is a cost we are willing to bear in order to reap the benefits of penicillin use. Similarly, we have concluded that the negative effects of managing biosolids in compliance with Part 503 and state regulations are not sufficient cause to forego the substantial societal benefits of land-based biosolids recycling.

1 Some issues remain unresolved.

2 Now, it sounds very self-serving for
3 academics to trumpet the need for more research, but
4 I hope it stems from a noble motive. Specifically,
5 we must never fall into the trap of thinking we are
6 too knowledgeable to learn more, to modify our personal
7 positions, or to acknowledge that we have overlooked
8 a particular issue.

9 What are some of the unresolved issues?
10 In the area of nutrients, quantitative guidelines based
11 on biosolids and soil characteristics are not available
12 for including phosphorus in nutrient management plans.
13 Unresolved microbiological issues include potential
14 regrowth of pathogens in stored biosolids, improved
15 methods for detecting and enumerating Salmonella, and
16 the relative public health risks of emerging pathogens
17 such as E.coli 0157, Cryptosporidium, and viruses not
18 detected by the current plaque assay method. For trace
19 elements, the maximum molybdenum value for exceptional
20 quality biosolids remains unresolved. The significance
21 of hormone-mimicking chemicals still needs to be resolved
22 as well.

23 The practical outgrowth of this perspective
24 is the recognition that regulations must change as the
25 knowledge base broadens.

1 For the unresolved issues, the probability
2 for catastrophe is miniscule.
3 In my opinion, there is no ticking time bomb,
4 no "oops" scenario, no evil microbe lurking in the shadows
5 waiting for the opportunity to cause an epidemic disease
6 outbreak, and no "unknowability" factor adequate to
7 justify discontinuance of biosolids application to land.
8 Of course scientific uncertainties remain, but we are
9 fine-tuning at this juncture. And a more comprehensive
10 understanding of mechanisms and interactions is necessary
11 to evaluate all of the long-term consequences of land
12 application of biosolids. However, no disasters have
13 occurred and none appear on the horizon. Moreover,
14 the quality of biosolids is continuously improving.
15 As Dr. Stehouwer's work has shown to be true in
16 Pennsylvania.
17 Now for some personal thoughts about
18 the diversity of opinion.
19 The academic perspective inherently
20 comprises a continuum of opinions. On one end of the
21 continuum are scientists who are most impressed with
22 the resilience of the ecosystem, its ability to respond
23 and adapt to insults, its tremendous capacity for self-
24 purification, and who through experience have come to
25 downplay or disregard prophecies of doom. This group

1 operates by the principle that, in the absence of any
2 hard data or model predictions to the contrary, we must
3 more forward under the assumption of safety. They accept
4 that decisions must be made with some degree of uncertainty
5 and take an "innocent until proven guilty" approach.
6 The other end of the spectrum includes
7 individuals who are most impressed with the fragility
8 of the ecosystem, the interconnectedness of processes,
9 the ability of an action in one part of the web to impact
10 another component of the system. For individuals of
11 this persuasion, the law of unintended consequences
12 dictates acting from an underlying philosphy of caution.
13 Guilt is assumed and the burden of proof is one those
14 claiming innocence. They, too, strive to solve an
15 environmental problem, but are reluctant to trust our
16 incomplete knowledge to the degree of the former group.
17 The important point is on the issue of
18 land application of biosolids, the scientific community
19 is not equally divided between two respected schools
20 of thought. Most scientists feel that the management
21 scheme outlined in Part 503 and used in Pennsylvania,
22 while not perfect, is adequately protective of human
23 health and the environment. The contrary opinions represent
24 a minority.
25 In conclusion, I have attempted to provide

1 a brief personal perspective on land application of
2 biosolids. I believe it represents the mainstream
3 scientific consensus. Hopefully, constructive debate
4 in hearing like this will promote broader understanding
5 that we can safely recycle this unavoidable by-product
6 of an advanced, industrialized society. Our ability
7 to manage biosolids with negligible adverse impact is
8 continually enhanced as the scope of knowledge broadens
9 and biosolids quality improves.
10 That concludes my comments. Thank you
11 for your attention.
12 CHAIRMAN BUNT: Thank you, Dr. Elliott.
13 Would you entertain some questions as well?
14 DR. ELLIOTT: Yes.
15 CHAIRMAN BUNT: In the absence of Chairman
16 George, Mr. Freeman.
17 REPRESENTATIVE FREEMAN: Thank you, Mr.
18 Chairman.
19 BY REPRESENTATIVE FREEMAN:
20 Q Dr. Elliott, you make very clear in your
21 comments that you felt the academic community differs
22 on how land-based biosolids can be recycled. Not if,
23 but rather how. That there is a broad-based consensus
24 that it is a safe practice and okay to do and should
25 not be a matter of concern; is that correct?

1 A Right. In other words, the consensus
2 would be there are issues -- is there are issues that
3 we need to deal with as with any topic of this magnitude,
4 but that given the current guidelines in management,
5 if properly carried out, are adequately protected.
6 Q What do you base your position that the
7 broad base of scientific opinion favors this?
8 A Well, it is more based on the fact that
9 the experts in the field evaluated an extensive evaluation
10 of the Part 503 risk assessment strategy. So based
11 on the fact that those who I consider to be the most
12 knowledgeable in the field were part of that activity.
13 Q And that would be how many scientists?
14 A I don't know the exact number, but to
15 be honest with you I have no idea, but it is the tens
16 to the hundred or so scientists who are involved in
17 that whole effort.
18 Q So your position, I am just trying to
19 clarify, your position is that the scientific community
20 supports this wholeheartedly. That is not based on
21 the survey data that was done in the scientific community?
22 A It is just based on those who are regarded
23 as experts in the field. Now, I should mention that
24 there is a couple USDA agricultural research committees,
25 regional research committees, in the W170 the western

1 regional group was sort of the group of experts that
2 did much of the evaluation and I think there are probably
3 30 or so scientists in that particular group.
4 Q There is no polling of scientists who
5 worked in this field to the best of your knowledge?
6 A No polling in the sense that those who
7 are experts have been involved.
8 Q And is it fair to say that there may
9 be others who are familiar in the field or who are experts
10 in the field who have yet to venture an opinion one
11 way or another as to whether it is safe?
12 A That's a possibility. They sure have
13 had the opportunity, since all these things have been
14 put out for public comment and scientific comment is
15 continually sought.
16 Q Then it is probably fair to say that
17 there are scientists in the field related to the field
18 who have yet to express their opinion on the issue?
19 A Should be, I agree.
20 REPRESENTATIVE FREEMAN: Thank you.
21 CHAIRMAN BUNT: Mr. Surra.
22 REPRESENTATIVE SURRA: Thank you, Mr.
23 Chairman.
24 BY REPRESENTATIVE SURRA:
25 Q Thank you, Dr. Elliott, for your testimony.

1 I don't think anybody is suggesting on this panel that
2 we should consider an outright prohibition of land
3 application. I think at least from my perspective,
4 and I know from many of my colleagues, is an uncertainty
5 of parameters and testing and oversight. In fact, just
6 in Europe I know that their requirements and levels
7 are much more stringent than the United States. Now
8 maybe the scientists over there know something or maybe
9 they are ignorant. I don't know. I think it is your
10 opinion that the vast majority of the scientific community
11 thinks that this current level is safe. I guess my
12 problem, you stated in your testimony that all these
13 experts cannot be wrong. I am sure an expert at the
14 time probably had something to do with the design and
15 construction of the Hindenburg and in talking, the best
16 experts built Chernobyl and probably an expert in forest
17 service heard of that brush fire out there last week.
18 Things happen, we make mistakes and that is what we
19 are trying to avoid.
20 But I would disagree when you say there
21 has been no disasters. Because I think there is a mother
22 here today, well if you really look into it, there is
23 a good chance that her son died from a disease that
24 was contracted, contracted from a biosolid.
25 What we are concerned about is the

1 preparation and treatment and lack thereof sometimes,
2 because when it comes to making a profit sometimes people
3 will do the wrong thing. The Inspector General of the
4 Environmental Protection Agency just in March of this
5 year said, "That the oversight of sludge application
6 in this country is almost negligible." That concerns
7 me.
8 My question to you is, and keep in mind
9 that I personally saw sludge that had pieces of a trans-
10 former in it and all types of stuff. Do you think it
11 is prudent that we do better testing on site randomly
12 to make sure that we are doing, we are putting on there
13 is safe to protect the public?
14 A I guess if there is a significant concern
15 that what leaves the treatment plant is not what actually
16 gets applied, then there is probably some merit to a
17 program of random testing. It needs to be statistically
18 valid. It needs to be done by some group that is truly
19 viewed as an independent disinterested third party.
20 So it would have to be a carefully crafted study, but
21 I am not sure there would be an adequate benefit to,
22 say, testing every load of material that came out of
23 the treatment plant prior to when it was spread.
24 Incidentally, I would also suggest that
25 I would not put any limits on what people flush down

1 the toilet from one of your previous comments. And
2 also realize --
3 Q Should transformers be in sludge?
4 A I just wanted to mention, in many municipal-
5 ities what comes into the wastewater treatment plant
6 is stormwater runoff as well as what is sanitary waste.
7 So, whatever happens to get washed down the streets
8 also goes to the treatment plant.
9 Q Well then that leads me to the question
10 of the safety of our sludge then. If that is within
11 the realm of possibilities. But if what I saw, and
12 I really have doubts that some of that material got
13 washed away, believe me. But that is not your fault.
14 A Okay, I got you.
15 REPRESENTATIVE SURRA: I do appreciate
16 your testimony, sir.
17 DR. ELLIOTT: I can't comment on that
18 particular material.
19 CHAIRMAN BUNT: Everybody has a picture
20 of a toilet or of pipes that a transformer came down,
21 I want to see the size of it. Representative Egolf.
22 REPRESENTATIVE EGOLF: No questions.
23 CHAIRMAN BUNT: Representative Miller
24 from York County.
25 REPRESENTATIVE MILLER: No questions.

1 CHAIRMAN BUNT: Representative Dr. Bastian.
2 REPRESENTATIVE BASTIAN: No questions.
3 CHAIRMAN BUNT: Representative Miller
4 from Berks.
5 BY REPRESENTATIVE MILLER:
6 Q Dr. Elliott, you mentioned in your testimony
7 hormone mimicking chemicals. This is the first one
8 testifying today that mentioned this. Could you provide
9 us more information on what precisely you are talking
10 about and what generates these hormone mimicking chemicals?
11 And also if you could just briefly tell us in the industry
12 or in the sludge application and how it is applied,
13 how could a transformer come through the nozzles in
14 which things is being sprayed -- applied to the land.
15 I am just curious about how something that large would
16 have come through the truck?
17 A Right. Well, I guess we are speculating
18 because we don't know what kind of transformer material
19 we are talking about here. But I am not sure it is
20 worth addressing that to any significant extent. But
21 obviously if it is was applied via the typical tines
22 on the back of a liquid application device, it wouldn't
23 fit through those devices.
24 But what I was referring to in terms of hormone
25 mimicking chemicals, There are a number of chemicals we use fairly

1 routinely in society, for example, nonaphenol (phonetic)
2 which is in fact a surface active agent like a detergent
3 or most material, that apparently in some situations,
4 in some animals can mimic hormones and cause a negative
5 effect in terms of the distribution of male offspring
6 and female offspring. So, it is a big issue right now.
7 Not so much from biosolids but in other context where
8 people are seeing strange effects on animals. And so
9 naturally people are asking what about biosolids and
10 what is the impact. You don't have organic materials
11 then that would have a half-life. It would be degradable
12 in the soil environment. So, it is just something that
13 has not been investigated much in the context of biosolids.
14 CHAIRMAN BUNT: Representative Smith.
15 REPRESENTATIVE SMITH: Thank you, Mr.
16 Chairman.
17 BY REPRESENTATIVE SMITH:
18 Q Doctor, you referred to the federal Part
19 503 regulations and the date in your testimony was 1993
20 that I presume they were published or went into effect.
21 Assuming that at some point subsequent to that Pennsyl-
22 vania's regulations more or less mimicked them or pick
23 up on the implementation of them. Does that create
24 some line of demarcation where, at least in your opinion
25 relative to how the sludges would be treated and processed

1 into a biosolid material, does that present some line
2 of demarcation? Previous to 1993 there wasn't as sound
3 a science behind the processing of these materials as
4 opposed to something that would have been developed
5 in 1994-95? Is there a line of demarcation there?
6 A Well, I mean, the scientific research
7 continues to go on, but interestingly, if you look at
8 most state regulations prior to the issuance of Part
9 503 they were more stringent in terms of, say, metal
10 loadings. Because we were taking a more cautious approach
11 at that point. Until the research database got large
12 enough to where we felt that we could relax some of
13 those numbers.
14 Q So when did Pennsylvania, say, adopt
15 the federal rules?
16 A 1997.
17 Q 1997?
18 A Right. And incidentally, the Part 503
19 is just a baseline value. In other words, states can
20 be more restrictive but obviously cannot be more liberal
21 than the federal guidelines. In fact, Pennsylvania
22 has taken some steps that are more stringent than Part
23 503.
24 Q So between '93 and '97 in Pennsylvania
25 the process and the regulations under which biosolids

1 and sludges would have been handled would have been
2 a little bit in a state of flux. But since 1997 it
3 would be more consistently managed?
4 A Well no, they actually had a set of guide-
5 lines in place. I'll have to get some help perhaps.
6 The DEP people are not here. But the original set of
7 guidelines I think as far back as '75 or so they had
8 a set of guidelines and actually, in many ways, they
9 were more restrictive than Part 503. So, prior to the
10 issuance of the state guidelines in 1997, there was
11 another set of regulations in place.
12 Q Relative to the amount of metals?
13 A Yes.
14 Q Primarily?
15 A Right.
16 Q That wouldn't have really account for
17 the concerns that have been raised relative to when
18 a material would leave a plant to when it might actually
19 be spread on the ground somewhere? Those regulations
20 really don't effect -- or do they have an effect on
21 that part of the handling?
22 A No, no. They are talking about the testing
23 of the material itself and in the prior regulations
24 the soil was tested as well.
25 Q Testing at the plant?

1 A Right.
2 Q And in the prior regulations, I think
3 once a year the soil had to be tested at every site
4 that had a permit.
5 REPRESENTATIVE SMITH: Thank you. Thank
6 you, Mr. Chairman.
7 CHAIRMAN BUNT: Chairman George.
8 BY REPRESENTATIVE GEORGE:
9 Q Professor, just one question if you will.
10 Have you ever heard of leachate from a waste plant being
11 dumped into a sewage plant?
12 A Excuse me, what being dumped?
13 Q Leachate from a waste plant being dumped
14 into a sewage plant?
15 A Well, yeah, for example I know of --
16 Q I didn't ask you that. I saw it. I
17 want to know if you did?
18 A Leachate from what kind of plant?
19 Q From a waste plant, from a waste site,
20 from a solid waste site.
21 A Yes, leachate from landfills is taken
22 to municipal --
23 Q Would you admit honestly that some of
24 that material, that leachate, because of its composition,
25 you are the expert not I, would be in some way close

1 to the proximity of hazardous material?

2 A If it is a hazardous material it cannot

3 be --

4 Q But if it is, I want to know do you think

5 that the material that is dumped in as leachate that

6 is developed from all of that material in a waste plant

7 could be hazardous?

8 A If it is a sanitary landfill, no, it

9 cannot be.

10 Q Cannot be.

11 A It cannot be because it is not a recro

12 approved landfill. If it is a hazardous material by

13 the federal regulations, it cannot be disposed of in

14 a sanitary landfill.

15 Q Doctor, we know it should not be. That

16 isn't what I asked you. Can it be?

17 A Of course, it can be.

18 Q That is all I am asking you.

19 A It can be.

20 Q It can be. A lot of the good people

21 may not know that.

22 A It sure can be. Anything is possible.

23 REPRESENTATIVE GEORGE: Thank you.

24 CHAIRMAN BUNT: Representative Steelman.

25 REPRESENTATIVE STEELMAN: Thank you.

1 BY REPRESENTATIVE STEELMAN:

2 Q Dr. Elliott, I also wanted to thank you
3 for testifying today and for stating at the beginning
4 of your testimony the affiliations that contribute to
5 your personal perspective on this issue. Because we
6 often have scientists testify before us who wish us to
7 believe that they represent only the purest of pure
8 science and the fact of the matter is that even pure
9 scientists usually have attitudes developed by their
10 history in the scientific community.

11 I was also like Representative Rubley
12 struck by some of your comments on unresolved issues.
13 She mentioned that the significance of permitting chemicals
14 and biosolids needs to be further explored. And just
15 this past week I saw something that if this turns out
16 to be true in the United States as it is in Europe,
17 may even constitute the smoking gun that at the moment
18 don't feel exists. It was a newspaper report of data
19 coming from Europe that suggests the presence in European
20 waterways of remarkably higher concentrations than expected,
21 hormone mimicking chemicals and hormones themselves,
22 a variety of medications of mood altering drugs that
23 apparently are produced as a result of the cumulative
24 human waste, human excretion of these products. And
25 the reason that anybody is noticing these things are

1 existing is apparently they are having significant impacts
2 on marine life, both vertebrate and invertebrate.
3 In the United States in the past several
4 years as well as around the world, it has been noted
5 that there are some significant mutations occurring
6 in amphibian life forms and there are very high death
7 rates among that amphibian population. Do you happen
8 know if Pennsylvania is currently participating in the
9 national project that is tracking these changes in
10 amphibian populations, which of course are very sensitive
11 indicators of the future in water quality?
12 A I don't know.
13 Q And do you think if this information
14 from Europe turns out to be accurate that we should
15 be looking more carefully at some of these chemicals
16 that may be present in biosolids and at the way that
17 current treatment practices deal with these chemicals
18 or fail to do deal with them?
19 A Well, I think you made a very interesting
20 point because these materials I think you said are in
21 the water and in cosmetics and other materials that
22 we routinely use. So I guess I would suggest that if
23 we are going to spend some money to try to limit in
24 some way the risk of those materials, biosolids are
25 pretty far down the list in terms of land application.

1 Putting them on the soil and trying to dream up some
2 remote scenario whereby these materials are taken up
3 by crops which are usually fed to animals and not to
4 humans and somehow humans are getting exposed. In other
5 words, there seems to be so much more important and
6 direct exposure routes than land application of biosolids.
7 Q However, if we don't actually know what
8 the pathway is, if the water supplies that are coming
9 into the sewage treatment plants are filled with these
10 chemicals and the purpose of the treatment to a great
11 extent is to reduce the volume of that liquid sewage,
12 should we not know if these chemicals are present and
13 if they are becoming concentrated in biosolids? If they are
14 not there in the first place, not a problem. If
15 they are not concentrated in biosolids, there is not
16 a problem. But should we or should we not know whether
17 there might be a problem?
18 A We would like to know. We would like
19 to know a lot more and that is why I tried to present
20 sort of a balanced perspective. There are many things
21 we don't know. The fact that they are present does
22 not particularly mean that they represent a significant
23 health threat. I suspect if I had sufficient analytical
24 capability, I could detect hormone mimicking chemicals
25 in my drinking water right now.

1 Q That is probably true and the reason
2 and it is important to go back to the studies, which
3 I hope we will have a chance to take a look at, but
4 the reason that these chemicals were actually being
5 found to be present in the waterways is because they
6 were having a visible effect on the health of animal
7 populations some of which were of economic importance.
8 That is why it seems to me we should at least have some
9 idea as to what is going on.
10 A No question. I said that is an emerging
11 issue that we need to resolve. And after that there
12 will be another issue. Whatever is the topic de jour
13 is what we happen to be investigating at the moment.
14 CHAIRMAN BUNT: Mr. Samuelson from
15 Northampton.
16 REPRESENTATIVE SAMUELSON: No questions.
17 CHAIRMAN BUNT: Mr. Vitali.
18 REPRESENTATIVE VITALI: Thank you, Mr.
19 Chairman. Before I ask my question I would just like
20 to make a public request for the record. That we do
21 have a continuation of this record to invite those people,
22 reference was made to a Cornell study that perhaps was
23 contrary. Perhaps we do have a panel of people presenting
24 the other perspective so we can get a full thought and
25 balance of perspective on the issue.

1 BY REPRESENTATIVE VITALI:

2 Q In any event, my question, and I missed
3 the first couple minutes of your testimony so excuse
4 me if I say something nonsensical. Reference has been
5 made to a study that you have undertaken for the benefit
6 of the Pennsylvania Department of Environmental Protection.
7 I am trying to flesh out the scope of the study, the
8 duration and the cause. Could you just tell me about
9 that?

10 A I think perhaps you are referring to
11 the study that Dr. Stehouwer was doing and not my own.

12 Q Okay, you're not working together on
13 it? Do you have a knowledge of that?

14 A Somewhat, and we are colleagues. So
15 we interact since we both deal with the same topic area.

16 Q To the extent that you are able to answer
17 that question would you?

18 A I am not sure what study you are referring
19 to or even really what your question is.

20 Q Okay. Are you aware the study contracted
21 between Pennsylvania Department of Environmental Resources
22 and Penn State is related to biosolids?

23 A Yes.

24 Q When did that study begin and what is
25 its duration?

1 A I will defer to the principal investigator,
2 if that is allowed under the rules here.
3 DR. STEHOUWER: As I indicated in my
4 testimony, I am currently conducting a study that is
5 being funded by DEP. That is a study where we are investi-
6 gating soils on 20 farms in 18 counties across the state
7 in Pennsylvania. Each farm we are sampling soils from
8 fields that have had biosolids repeatedly applied and
9 sampling fields with no biosolids application. We are
10 sampling soils at three depths. We are sampling crop
11 tissues that are grown on those fields and we are analyzing
12 those materials for nutrients and trace metals.
13 BY REPRESENTATIVE VITALI: (To Dr. Stehouwer)
14 Q You mentioned it is being funded by the
15 Department of Environmental Resources?
16 A Yes.
17 Q What is the cost of that? What is the
18 amount of the contract? How many dollars are involved?
19 A This is a three-year study. It began
20 in the fall of '98. I do not have the exact dollar
21 figure with me, but I believe it is around 150,000.
22 Q Over three years?
23 A Over three years.
24 Q $50,000 a year?
25 A Approximately.

1 Q Do you think $50,000 a year is adequate
2 given the nature of this problem and the magnitude of
3 farming in Pennsylvania? Do you think that is enough?
4 A Well I could be self-serving and say,
5 no, it is not nearly enough.
6 CHAIRMAN BUNT: Ask anybody from Penn
7 State if it is enough.
8 DR. STEHOUWER: It is adequate to do
9 the things that I said I would do, the type of testing
10 I said I would do. If you want to do more extensive
11 testing for organic chemicals, for example, or more
12 intensive sampling, it would require more money.
13 BY REPRESENTATIVE VITALI:
14 Q I got the reaction $50,000 doesn't seem
15 like a lot of money. How does that dollar figure compare
16 to other studies? I don't have a sense for this but
17 is this on a low scale of things, $50,000 a year?
18 A It is I guess a moderate -- I mean, depending,
19 research contracts vary from $5,000 to millions of dollars
20 depending on the scope of the study and the duration
21 and the number of people involved, what is being studied.
22 I don't know the distribution of funding grants coming
23 into Penn State.
24 REPRESENTATIVE VITALI: Okay. Thank
25 you.

1 CHAIRMAN BUNT: We have five minutes.
2 We are going to permit a staff member who has questions.
3 MR. OKO: Thank you, Chairman Bunt.
4 BY MR. OKO: (To Dr. Elliott)
5 Q I have never seen such a grand pronouncement
6 here. It is in some ways good because you are trying
7 to make conclusions out of consensuses and you are trying
8 to make broad interpretations. I have a question related
9 to them, which is, you are a member of this national
10 group. I would say for you to make all these broad
11 pronouncements you must be knowledgeable in the field
12 and what people are doing. And if you say we ought
13 to be doing a risk base, we ought to be developing ways
14 to make this stuff better. So let me just ask you a
15 very short question.
16 Representative George filed a complaint
17 about sludge. DEP went out and never took a test of
18 the sludge. In other states do they test when complaints
19 are filed?
20 A I don't know the answer for a lot of
21 other states, but I think I would agree with Dr. Stehouwer,
22 it really depends on the complaint, what the nature
23 of the complaint is. If it is a complaint that the
24 material smells bad, I am not sure that a test is going
25 to be of much value.

1 Q I would appreciate, I mean my Chairman,
2 that since you are part of a national group that you
3 try to find out whether other states test. We found
4 that in Pennsylvania water treatment plants test once
5 a month for sludge. In other states do they test more
6 than once a month?
7 A In fact, in Pennsylvania the large, it
8 would depend on what the flow is. So it depends on
9 the flow into the plant in terms of their frequency
10 of testing.
11 Q But other states.
12 A I don't know.
13 Q That would be helpful for this Committee
14 also. We had a comment earlier that they don't test
15 after hormones. Pennsylvania has reduced the amount
16 of testing. Do other states test more than Pennsylvania
17 for hormones?
18 A I would suspect that other states probably
19 have some requirement where a sample is taken once a
20 year at any site that is permitted. It is really to
21 check for metals.
22 Q And would that sample be done by the
23 Department or would it be done by the former or it all
24 depends?
25 A That is probably the responsibility

1 of the owner of the property. So he would have to send
2 that out to a commercial laboratory.
3 Q I will just finish up with what Representative
4 Surra said. We are not here talking about banning sludge.
5 We are talking about testing, we are talking about local
6 control, we are talking about improving the quality.
7 A Correct.
8 Q And frankly there is nothing in here
9 that talks really about that, very little, towards the
10 end. So if there is knowledge that you have from other
11 states, from other experiences to make this better,
12 we would like to know. We would like to hear grand
13 pronouncements.
14 A I would like to offer a disclaimer. On
15 Monday I found out that I was to give this testimony.
16 So, as I indicated in the beginning of my testimony,
17 my comments reflect a talk that I gave at a National
18 Science Foundation sponsored conference last month.
19 I wasn't given any direct guidance on what to speak
20 about.
21 CHAIRMAN BUNT: Thank you, doctor. Mr.
22 Hershey.
23 CHAIRMAN HERSHEY: Thank you. I have
24 no direct questions for any of the presenters. I wanted
25 to thank everyone for coming and taking part.

1 I want to make a statement on my experience
2 as a farmer in Chester County. We have a farm that --
3 dairy farm. We have used sewage sludge for a little
4 over ten years. Following all the directions the county
5 conservation district and the state regulations. It
6 took a year and a half to get approved. We follow all
7 the guidelines. We periodically apply depending on
8 the crop. It is not every year. Sometimes it is every
9 other year, depending what is on the field. The only
10 build up that we have noticed, in backing up a moment,
11 we do have Brubaker Agronomic Field Services test every field
12 every year. The only build up we have on anything so far
13 is lime, the pH, which is applied. Last fall I drilled
14 a 110-foot deep well. The water supply was 50 gallons
15 per minute. Checked by the Chester County Health Department.
16 It was very potable and ready to sell if I wanted to.
17 Thank you, Mr. Chairman.
18 CHAIRMAN BUNT: I don't believe there
19 are any more questions. Based on what we heard here
20 today, I am going to throw out an idea. Sorry Mr. George,
21 Chairman George is not here right now to hear these,
22 but certainly his staff is going to take my remarks
23 back. The idea that may have some merit for all of
24 us to think about and pursue. I am going to direct
25 my staff to work with the regulatory agencies, the

1 industry, academia and any others who would like to
2 participate in developing a proposal for a private project
3 at random, third party sampling and testing biosolids
4 at the point of land application. Now I am obviously
5 not prepared to speak in terms of specifics as to the
6 scope of the project or the cost or who should bear
7 them and other details, but I do believe the results
8 of such a program would shed considerable light on one
9 of the major concerns that we have here. Anyone present
10 who would like to participate in the development of
11 this proposed program is welcome to contact any member
12 of my staff or Mr. Hershey's staff directly.
13 And with that this meeting is adjourned.
14 (Whereupon at 1:00 p.m. the hearing was
15 concluded.)
16 (The prepared testimony of Fay and Linda
17 Bacon is as follows:)
18 May 17, 2000
19 PA Congress, Gov. Ridge and Rep. Barley
20 PA Capitol Building
21 Harrisburg PA
22 Dear Sirs,
23 As citizens of the United States and
24 of the state of PA, we are greatly disturbed that we
25 are not allowed to be heard at this meeting of Congress

1 on the very important issues that concern us.

2 We are resent that our representatives

3 think that we do not need the rights to decide for ourselves

4 what we want to be allowed to be done with our township

5 land, in the way of concentrated cattle farms and sludge

6 dumping on farm for crops.

7 We feel further testing needs to be on

8 this toxic sludge before is dumped on farmland, entering

9 into our well water, and used to grow such crops as

10 soybeans (which are found to absorb many toxics, and

11 are used even in baby formula.)

12 This testing by qualified persons could

13 be paid for by a tipping fee on sludge, but of course,

14 this would take a large bite out of Mr. Barley's millions,

15 and Waste Management, and Wrightsville money for dumping

16 this toxic material on our lands. In the case of Mr.

17 Barley, (and his family owned farms) we believe that

18 he should not be involved in PA legislation on this

19 matter, as a pure conflict of interest.

20 We feel the people in their individual

21 townships are the only ones who should be deciding on

22 the laws that they feel are necessary to protect their

23 farms, land and homes, water and their families. This

24 is the right of the people to decide, and not a few

25 privileged politicians. If they have decided that we

1 cannot have these rights, maybe it is time for the people
2 to stand up and say we need new representatives that
3 will represent all the people of PA for their rights,
4 and not just represent the rights of a few, who wish
5 to make millions on the backs of the people of PA.
6 Sincerely,
7 Residents of Chanceford Township, PA.
8 **A CASE AGAINST SLUDGE!**
9 The 503 Sludge Rule is bad science. When
10 the EPA created the 503 Rule, it was bad and it hasn't
11 gotten any better with age. It is simply intolerable
12 that the EPA, instead of providing an example for open
13 scientific discussion, has continuously violated key
14 environmental legislation, stifling legitimate dissent.
15 EPA regulations have everything to do with elections
16 and nothing to do with protecting public health and
17 the environment, according to David L. Lewis, Ph.D.
18 US EPA/University of Georgia, and the 503 Sludge Rule
19 is Political Science at its worst. To make a point
20 that bad science in environmental regulations puts public
21 health and the environment at risk, Dr. Lewis asked
22 EPA's own scientists which of the agency's rules and
23 regulations is most scientifically unsound. Without
24 hesitation, many responded that EPA's 503 sludge rule
25 is so void of any scientific basis that it's referred

1 to as "sludge magic" by agency scientists who reviewed
2 it in the early 1990's. EPA scientists generally share
3 a common political position, which is no politics when
4 it comes to science. A strong aversion to mixing politics
5 with science, plus a well-justified fear of retaliation,
6 keeps most EPA scientists from commenting publicly.
7 Nevertheless, a growing number of them are beginning
8 to blow the whistle.
9 Biosolids is a term coined in 1992 by
10 a PR firm, Powell Tate, for the Water Environmental
11 Federation (WEF), a lobbying organization formerly known
12 as the Federation of Sewage Works Associations, because
13 "the negatives of the term sludge are overwhelming."
14 If looked up in the Harper-Collins Dictionary of
15 Environmental Science, sludge is defined as "A viscous,
16 semisolid mixture of bacteria and virus-laden organic
17 matter, toxic metals, synthetic organic chemicals, and
18 settled solids removed from domestic and industrial
19 wastewater at sewage treatment plant." Biosolids are
20 being promoted for its "nutrient enrichment and organic
21 matter improvement to soils."
22 The poor science of the 503 sludge rule
23 continues: Microorganisms (bacteria, fungi, and algae)
24 naturally present in soil carry out a variety of processes
25 beneficial to man, animals and plants living in and

1 around the soil. We also depend on microorganisms to
2 break down man-made organic chemicals, such as pesticides,
3 herbicides, and organic solvents when they contaminate
4 soil. In this manner, microorganisms play an important
5 role in detoxifying soil preventing such chemicals from
6 building up to high levels that are harmful to man and
7 animals contacting the soil, or which feed upon products
8 grown in the soil.
9 Trace amounts of heavy metals pose a
10 great problem in sludge because chromium, copper, mercury,
11 and zinc are often present in high enough concentrations
12 in sludge to significantly inhibit soil microorganisms.
13 The concentrations are high enough to more than double
14 the length of time it would take microorganisms to break
15 down organic chemicals in soil. Although the micro-
16 organisms would remain viable, the rates at which they
17 build topsoil, produce essential nutrients for other
18 living organisms, and detoxify organic chemical contaminants
19 can be expected to diminish by two-fold or more from
20 the effects of sludge.
21 Copper leaches from water pipes as one
22 of the ways it arrives in sludge. Two metals, zinc
23 and copper, are present in sludge at levels over concentra-
24 tions necessary to double the length of time soil micro-
25 organisms would take to break down organic chemicals.

1 Thus, a strong toxic or inhibitory effect would still
2 be expected even when the sludge is diluted ten to a
3 thousand fold by tilling it with soil. For example,
4 if a one-inch layer of sludge were mixed with the top
5 one thousand inches (83 feet) of soil, the resulting
6 mixture would still be sufficiently toxic that it would
7 require microorganisms twice as long to break down organic
8 chemicals when compared with soil not contaminated with
9 the sludge. In other words, no practical amount of
10 tilling would render this sludge non-toxic to soil micro-
11 organisms.
12 The slowing down of important soil microbial
13 processes caused by traces of metals in sludge has been
14 overlooked in federal and state regulations when considering
15 hazards posed to human health and the environment. Con-
16 centrations of chromium, copper, mercury, and zinc present
17 in sludge can be expected to cause pesticides, herbicides,
18 and organic solvents to persist longer in soil to which
19 the sludge has been applied. This enhanced persistence
20 increases the probability that such chemicals will contaminate
21 fruits and vegetables in concentrations exceeding current
22 safety standards.
23 As pesticides, herbicides, and organic
24 solvents remain in soil for longer periods of time,
25 the chemicals are exposed to more wind and rain events.

1 This increases the probability that potentially harmful
2 chemicals will contaminate surface water, groundwater,
3 and other land areas.
4 The adverse effects described above may
5 be manifested soon after sludge is applied to land,
6 or may not be manifested until changes occur in moisture,
7 soil pH, nutrient conditions, land use, or soil microbial
8 communities. Thus, harmful effects may not begin to
9 manifest themselves until many months or years after
10 sludge is applied.
11 Except for a few places on Earth where
12 lead ore occurs, the pollution has been a direct result
13 of man. CDC
14 **SEWAGE SLUDGE/BIOSOLIDS BACK IN THE NEWS**
15 **House Science Committee Hearing**(DC) on
16 March 22, Chairman Senesenbrenner referred to an Inspector
17 General Report entitled WATER-Biosolids Management
18 and Enforcement 2000-P-10 dated March 20, 2000 stated:
19 **"EPA DOES NOT HAVE AN EFFECTIVE PROGRAM FOR ENSURING**
20 **COMPLIANCE WITH THE LAND APPLICATION REQUIREMENTS OF**
21 **PART 503. ACCORDINGLY, WHILE EPA PROMOTES LAND APPLICATION,**
22 **EPA CANNOT ASSURE THE PUBLIC THAT CURRENT LAND APPLICATION**
23 **PRACTICES ARE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRON-**
24 **MENT."**
25 **2000 PA News** Dec 7 Pollution of drinking

1 water and the environment by antibiotics will be discussed
2 at a meeting of European experts in Britain next month.
3 A large proportion of the antibiotics administered as
4 medicines or products pass out of the body in the urine
5 to reach natural water sources such as rivers in sewage
6 discharges, or contaminate land when sewage sludge is
7 used as fertilizer.
8 **Press Journal** '99 ran story on NAACP
9 urging **Middletown, PA** residents to fight proposed sludge
10 treatment plant.
11 **USA TODAY** covered EPA SLUDGE RULE on
12 editorial page (Oct. 7, '99) "EPA Looks Away from Possible
13 Health Threat":http://www.usatoday.com/news/comment/nceditf.
14 htm
15 **Kern County California** says "No!" to
16 "Fudge Magic" (Oct. 5, '99) "Supervisors Ban Use of
17 Sludge on Fields":hhtp://www.bakersfield.com/bak/i--
18 1272958173.asp
19 **Time Magazine** ran a second article on
20 EPA's 503 Sludge Rule in the September 27 issue. The
21 article focused on personal convictions of CDC (Center
22 for Disease Control in U.S.) investigator Joe Cocalis.
23 The CDC is investigating sludge-associated illnesses
24 reported by the United Mine Workers of America (UMW).
25 Miners exposed to sludge applied to mining areas are

1 experiencing respiratory problems and severe skin rashes.
2 The article also points to concerns raised by the death
3 of 26-year-old Shayne Conner in New Hampshire and an
4 11-year-old **Pennsylvania** boy, Anthony Behun. They died
5 several days after being exposed to sludge dumped in
6 their neighborhoods. Both youths, like others living
7 nearby who were exposed to the sludge, experienced
8 symptoms similar to the **Pennsylvania** miners.
9 **Reader's Digest** has an article in the
10 June issue (pages 116-121) on how badly administered
11 the EPA is and how politics over science has put human
12 health and the environment at risk. The article, "Weird
13 Science at the EPA" by Trevor Armbrister, includes interviews
14 with me and other critics of the way the agency is run.
15 Its publication is expected to precipitate hearings
16 in both the Senate and House of Representatives.
17 **Bridge News Services** published an editorial
18 by Bonner Cohen of the Lexington Institute (June 8,
19 1999) titled "America's Environmental Regulator Goes
20 Astray." The article deals with dissenting scientists
21 at the EPA. It focuses on personal comments made by
22 Washington EPA scientist Hugh Wise, the substance of
23 whistleblower cases filed against EPA by Brian Rimar
24 and Dr. Lewis*, and remarks made by Washington, DC attorney
25 Stephen Kohn, president of the National Whistleblower

1 Center. According to the commentary, the growing number
2 of EPA dissidents organizing to make their voices heard
3 on Capitol Hill and in the news media "are becoming
4 a voice to be reckoned with."
5 **The Wall Street Journal** ran another excellent
6 editorial dealing with politics over science at EPA
7 ("Science's Belated Complaint," June 7, 1999, p. A22).
8 **The Lexington Institute and the Institute**
9 **for Policy Innovation** published Dr. Lewis'* essay, "Sludge
10 Magic: EPA Spreads E.Coli" as part of their report,
11 "OUT OF CONTROL: Ten Case Studies in Regulatory Abuse."
12 **Wisconsin Department of Health '92 (WDOH)**
13 did a human cancer risk assessment for dioxin TEQ in
14 agricultural soils. Using realistic and conservative
15 assumptions, WDOH concluded that dioxin levels of 1.2
16 ppt in agricultural soil (other than grazing pastures)
17 and 0.19 ppt in soil of grazing pastures is protective
18 of human health. Current Wisconsin sludge regulations
19 specify a 0.5 ppt soil limit for pastures and a 1.2
20 ppt dioxin limit in other agricultural soil. On December
21 23, EPA's Office of Water proposed a limit of 300 ppt
22 of dioxin TEQ for sludge that is land applied.
23 **Exeter Twp. (Berks Co) PA** '97 $50. per
24 ton tipping fee, **Rush Twp (Centre County, PA)** 1999 $40
25 per ton tipping fee and **Dean Twp. (Cambria County, PA)**

1 2000 $40 per ton tipping fee ordinance on any sewage
2 sludge or biosolids products" to cover testing.
3 *David Lewis, Ph.D. is a Un. of Georgia scientist and
4 veteran researcher at the EPA, he has published more
5 than 40 scientific papers on subjects ranging from global
6 climate changes to microbial kinetics. In the early
7 1990s, on his own time, he began a series of experiments
8 on medical devices' possible contamination with the
9 AIDS virus. Among other things, he found that contrary
10 to popular thought, HIV can live outside the body for
11 several days in the lubricating fluids used in dental
12 equipment; it can also survive high-level disinfection.
13 Lewis' research has had enormous impact on dentistry.
14 The Centers for Disease Control and Prevention changed
15 its guidelines. The FDA began to require that all dentists
16 in the country sterilize their instruments between patients.
17 State of New York Department of Health
18 Environmental Health Workshop March, 1998
19 Outstanding Questions About Public Health
20 From Land Application of Sludge
21 Charlotte Hartman, NSA
22 Dr. Margolin, Microbiologist, University
23 of New Hampshire (UNH), Telephone (603) 778-4887, at
24 selectman meeting, in Milton, NH in Sept, 97, told a
25 roomful of people about the public health risks posed

1 by enteric viruses and protozoa in sewage sludge that
2 has received some treatment.
3 1. New technology enables researchers
4 to document the survival of very hardy disease causing
5 organisms and their movement from sludge into wells
6 and groundwater.
7 2. Lab studies have repeatedly demonstrated
8 the enteric viruses and protozoa breaking through the
9 bottoms of 6 to 8 foot soil columns after about 45 days.
10 These fecal organisms can survive for up to a year and
11 travel long distances in groundwater and aquifers.
12 3. A graduate student of Dr. Margolin's
13 cited a case where enteric viruses from sludge were
14 found in a well 90-ft deep and located 270 ft from the
15 sludge application site. Problem worse in cool damp
16 parts of the country such as NY. Viruses multiply during
17 a stockpiling.
18 4. Exposure from both drinking contaminated
19 water and showering in it. Showering results in micro-
20 aerosol droplets transmitting disease by inhalation.
21 5. Most at risk are children under the
22 age of one; elderly and people with immune comprised
23 systems, transplants, AIDS.
24 6. Only four labs east of Mississippi
25 have equipment and expertise to do this testing and

1 UNH is one of them.

2 7. Inadequate EPA assessment of the
3 pathogen risk requires DOH study and establishment of
4 an accredited lab in New York to test for all pathogens
5 identified in sludge. The public questions the expertise
6 within DEC to make these health and safety decisions.

7 8. CDC two distinct strains of Cryptospor-
8 idium Milwaukee 100 deaths, over 40,000 infected. Cattle
9 have been blamed but new research suggests it may have
10 been a human strain from sewer overflows or inadequate
11 sewage treatment. No requirement to test or monitor
12 crypto migration from application sites to water. "Genetic
13 Polymorphism among Cryptosporidium parvum Isolates:
14 Evidence of Two Distinct Human Transmission Cycles"
15 Emerging Infectious Diseases, Vol 3 No 4, CDC, Atlanta,
16 Ga. Telephone (404) 639-3311. Foodborne diseases are
17 increasing from contamination by feces. The identified
18 pathogens are also in sludge and should be investigated
19 as a possible contributor in any assessment including
20 the Presidential Food Contamination Study.

21 9. Salmonella: regrowth, EPA test methods
22 not adequate "Enumerating Salmonella in biosolids for
23 compliance with pathogen regulations" William A. Yanko
24 et al. Water Environment Research, Vol. 67, No. 9.

25 10. Abstract Excerpt: "A simple dispersion

1 model suggests that sludge-amended soil may increase
2 regional atmospheric MeHg concentrations by 5%." "Methyl
3 Mercury Contamination and Emission to the Atmosphere
4 from Soil amended with Municipal Sewage Sludge" Anthony
5 Capri, et al. Journal Environmental Quality, Vol. 26,
6 November-December 1997 EPA has discounted study although
7 they have not read it. Waste Policy Alert 3/20/98
8 11. Dioxins: Not required to be tested
9 either in sludge or sludge products using cement kiln
10 dust and ash. (testing for levels is underway at sewage
11 treatment plants)
12 12. No cancer risk assessment for arsenic
13 1 in ten thousand Vs 1 in one million
14 13. Radioactive waste in sludge from
15 decontamination laundries, hospitals, patients excreta
16 receiving chemo therapy for cancer, Superfund leachates,
17 and NRC dischargers to treatment plants (testing is
18 underway at sewage treatment plants) EPA will not reveal
19 names of specific sites with problems because it is
20 voluntary reporting.
21 14. Ecological study (Oak Ridge Study
22 has been peer reviewed and at EPA for a year.) FOIL
23 requests and appeals of denial have not been successful.
24 Looking for assistance from Senators.
25 15. Clinton Executive Order "Protection

of Children from Environmental Health Risks and Safety Risks" Lead levels in 503's and questions about child ingestion pathway should call for reevaluation. Cleanup soil standard 400ppm ceiling level in sludge 840ppm. Staneck and Calabrese child ingestion study: EPA levels 9 times less protective than should be. "Daily Estimates of Soil Ingestion in Children." Environmental Health Perspectives, (1995). "One application of sludge adds more lead to the soil than did 60 years of driving with leaded gasoline" Stanford Tackett Professor Emeritus Indiana Univ. PA. Telephone (412) 465-7773. Risk based on adult white males is not protective of children, the elderly, pregnant women, and the immune compromised.

16. EPA standards are based on nine heavy metals (lead, cadmium, arsenic, copper, mercury, molybdenum, nickel, selenium, and zinc) allows pollution to reach maximum "acceptable" levels with one-size fits all approach. Acidic soils, abundant rainfall, diverse crops, shallow depth to water require standards specific to New York. The Case for Caution, Working Paper, August, 1997 Cornell Waste Management Institute **Revised February, 1999.**

17. There are no EPA comprehensive air emission standards to control volatile organics, odors, or pathogens (bioaresols such as Aspergillus) from

1 land application or processing sites. When sludge dries
2 it can be carried some distance from application and
3 processing sites. Heavy metals, pathogens, and chemicals
4 as particulates can be inhaled and health implications
5 including asthma should be investigated at both land
6 application sites and processing facilities.
7 18. NYSDOH emphasis should be on toxic
8 use reduction and pollution prevention rather than an
9 end of the pipe control and manage approach.
10 19. Studies needed to establish levels
11 of pharmaceuticals and surfactants in sludge and their
12 ability to disrupt the endocrine system by mimicking
13 hormones. "Sexual abnormalities found in Mississippi
14 walleye" Minneapolis Star Tribune 4/18/98. Study near
15 sewage-treatment plant has found that males had reduced
16 levels of testosterone and high levels of estrogen,
17 raising concerns fish are becoming feminized and that
18 their breeding ability may be impaired. These findings
19 are the latest in a series of studies done in North
20 America and Europe that have found reproductive problems,
21 sexual abnormalities and birth defects in a variety
22 of wildlife exposed to relatively low levels of chemicals
23 (endocrine disruptors).
24 20. Dr. David Lewis, EPA Whistleblower
25 706-355-8000. Says science to back up EPA sludge

1 regulations was so bad they were referred to as "sludge
2 magic" within the agency.
3 The federal ban on the ocean dumping
4 of sludge without an investigation of alternatives and
5 mandating enforceable safe methods and processes has
6 created one of the critical environmental health problems
7 of the nineties. Toxic sludge that damaged the ocean
8 ecosystem is being transferred to land, water, air,
9 and food as the most "cost effective" disposal option.
10 Liability is transferred from municipalities and dischargers
11 to the farmer or landowner. Potentially at risk are
12 consumers, farmers and their families, farm workers,
13 and neighbors of land application and processing
14 facilities.
15 Sludge and sludge based products are
16 being promoted by EPA for use on food crop production
17 land, grazing land, public parks, forests, for home
18 garden use and for use in mine reclamation. Sludge
19 is the accumulated solids produced by wastewater treatment
20 plants and solids left from septage, the liquid pumped
21 from septic tanks. Sludge contains varying degrees
22 of heavy metals, man-made chemicals (e.g. PCB's, pesticides,
23 dioxin) detergents (surfactants suspected endocrine
24 disrupters), pathogens, and radioactive contaminants.
25 Materials from human, residential industrial, and hospital

1 sources, runoff from streets, and landfill leachates
2 including Superfund sites. The cleaner the wastewater
3 the more concentrated the contaminants in sludge.
4 New York Department of Health must conduct
5 an independent public health study on the use of sewage
6 sludge and sludge by-products and make recommendations
7 on the upcoming Dec revised Part 360 regulations based
8 on conditions and crops specific to New York. Uses
9 would include fertilizer and soil amendment on agricultural
10 lands; on food crops, home gardens, mine/quarry reclamation,
11 public parks and golf courses. Health assessment of
12 the various processes used to produce a sewage sludge
13 product such as composting, pelletization, and alkaline
14 admixtures.
15 **Overview of Problems with EPA 503 Risk**
16 **Assessment**
17 **Source:** The Case for Caution, Working
18 Paper, August, 1997 Cornell Waste Management Institute.
19 Pollution is allowed to reach maximum
20 "acceptable levels with no safety or uncertainty factors.
21 Synergetic and mutagenic effects of all
22 the many contaminants in sludge as well as multiple
23 pathway exposure have not been evaluated.
24 Risk based on adult white males and not
25 protective of children, the elderly, and the growing

population of the immune compromised in our society.

Cancer risk is based on 1 in 10,000 vs. 1 in 1,000,000 this includes arsenic.

Assessed old dietary data that was very low in vegetables and fruits, assumed very low plant uptake coefficients, and used averages not crop or soil specific.

Eliminated from consideration pollutants with insufficient data for a full risk assessment.

No synthetic organic chemicals or radioactivity are regulated.

Groundwater and surface water calculations assume large dilution before reaching wells and assumed only 0.24% of model watershed receives sludge.

Photoxicity is underestimated with the potential of a 50% crop yield reduction.

Potential health impacts to grazing animals.

Inadequate assessment of pathogen risks and ecological impacts.

Inadequate enforcement and oversight and no labeling requirements of sludge products.

Scientists within EPA had concerns about turning America's farmlands into waste sites contaminated with toxic metals and pathogens. "The science used to support the regulations was so bad it was officially

1 referred to within EPA as "sludge magic." "To me it
2 is pretty scary when a handful of non-elected government
3 officials at EPA can decide to protect whales from potential
4 risks and put America's food supply and the national
5 economy clearly at risk--turning a deaf ear to protests
6 from their own expert scientists." Dr. David Lewis,
7 EPA Blowing the Whistle on EPA's Misuse of Science Interview
8 Environmental News Dec. 1997. EPA Science: Casualty
9 of Election Politics. Nature Vol 381, June 27, 1996.
10 **Pathogens**
11 In 1989 the EPA documented the presence
12 of 25 infectious agents in sewage sludge: five bacteria
13 (including Salmonella, E Coli), nine viruses (including
14 Hepatitis A), five intestinal worms (i.e., tapeworms
15 and hookworms), five protozoa, and fungi (Aspergillus
16 that causes respiratory diseases and risk of life-
17 threatening species).
18 EPA allows treatment plants to pass the
19 test for either E Coli or Salmonella not both.
20 Salmonella regrowth does occur and EPA
21 testing methods have been found to be inadequate by
22 researchers. Enumerating Salmonella in biosolids for
23 compliance with pathogen regulations William A. Yanko
24 et al. Water Environment Research Vol. 67 No. 9.
25 Research suggests that bacteria such

as Salmonella are caught in clumps of gunk in sludge and are coated with water-repellent substances such as animal fats, petroleum, or industrial lubricants and standard tests may significantly underestimate the hidden bacteria. David Lewis, Science News, Vol. 153, Feb. 28, 1998.

New technology has improved pathogen detection for example, CDC using DNA testing found two distinct human transmission strains of Cryptosporidium that was responsible for the Milwaukee outbreak that caused 100 deaths and infected over 40,000. Cattle have been blamed but new research suggests it may have been a human strain from sewer overflows or inadequate sewage treatment. Therefore focusing solely on cattle could fail to eliminate a very important source of infection. Genetic Polymorphism among Cryptosporidium parvum isolates: Evidence of Two Distinct Human Transmission Cycles, CDC Emerging Infectious Diseases Vol 3, No. 4.

The DOH must answer these outstanding pathogen questions and develop testing and monitoring of sludge land application sites and processing facilities.

Require cyrptosporidium monitoring and an incidence database from sludge, sludge products, septage land application and storage to water sources in DEC regulations. Establish an approved testing

1 lab in New York.

2 Require the testing for both E Coli and

3 Salmonella by DEC.

4 Require testing for viruses and parasites

5 in sludge and sludge products.

6 **Your POWER is too important to lose!!**

7 **THE POWER TO PROTECT**

8 Under Pennsylvania's Second Class Township

9 Code there are provisions which empower and authorize

10 townships to adopt ordinances that serve to protect

11 the health, safety and welfare of their residents. **This**

12 **POWER is too important to have taken away.**

13 In the past year many townships throughout

14 Pennsylvania found it legal, constitutional and necessary

15 to enact ordinances that protect their residents from

16 the potential health hazards from the land application

17 of SEWAGE SLUDGE (Biosolids) which is being promoted

18 as a fertilizer.

19 Two different ordinances are being adopted:

20 (#1) A per ton tipping fee ordinance which pays for

21 the testing of sewage sludge to ensure its compliance

22 and safety under existing regulation. (#2) A bonding

23 and insurance ordinance which requires money to be paid

24 to and held by the township in the event environmental

25 damage occurs. These ordinances protect - they do not

1 control, regulate, restrict or ban the use of sewage
2 sludge, and therefore, they are not in conflict with
3 the Nutrient Management Act or with the Solid Waste
4 Act and are not preempted.
5 **THE REMOVAL OF POWER!**
6 Because of the growing popularity of
7 these ordinances the PWEA (Pennsylvania Water Environment
8 Association) which is comprised of various entities
9 that profit from the land application of sewage sludge
10 are currently launching an effort through DEP's Biosolids
11 Committee to advise our legislators to eliminate the
12 ability of township governments to pass local ordinances
13 dealing with sewage sludge.
14 **WHAT CAN BE DONE?**
15 As supervisors of Pennsylvania you must
16 not allow the cries of big business to take your power
17 away. These provisions protect residents from all kinds
18 of environmental threats and are far too important to
19 have pulled from our townships.
20 Please scrutinize DEP's cozy relationship
21 with corporations that profit from the land application
22 of sewage sludge and question the role DEP is playing
23 in promoting and defending the practice of applying
24 this controversial waste material upon the land.
25 We urge you to make sure legislation

is retained that allows continual local control over health, safety and welfare and that every municipality retain the ability to pass ordinances which protect the health, safety and welfare of its residents within its boundaries.

EXISTING PROVISIONS

As codified in 53 P.S. 65100 et seq. to provide for the protection and preservation of the natural resources, human resources, and to promote, protect and facilitate public health, safety and welfare.

As codified in 53 P.S. 65701, et seq. authorizes the township to enact ordinances dealing with the protection of the township residents health, nuisances, and promotion of public safety.

As codified in 53 P.S. 65708 empowers the township to prohibit the dumping or otherwise depositing of ashes, garbage, rubbish, and other refuse materials within the township.

In the Township Supervisor Handbook on page 52 it states "Townships can adopt reasonable regulations to protect the health, safety of residents. A court determined sewage sludge from a composing facility was refuse under the Code and could be regulated by the township."

FOR MORE INFORMATION

1 For copies of draft ordinances contact:
2 **P.A.T.S. @ tel. (814) 342-0177 or email: patsl@csrlink.net**
3 For Sewage Sludge information contact:
4 **PEN @ tel. (610) 983-0874 or visit our website @ penweb.org**
5 **Pennsylvania Environmental Network Sludge Position**
6 The **PENNSYLVANIA ENVIRONMENTAL NETWORK**,
7 organized in 1989, is a statewide alliance of grassroots
8 groups and individuals fighting for environmental justice.
9 PEN has 12 Leadership Networks, each
10 devoted to a specific concern, such as Incineration,
11 Nuclear Waste, Coal Mining, Dioxin, Forestry, Sprawl,
12 Fluoride, CAFO's, Military Toxics, and Sludge.
13 The PEN Sludge Network, formed in 1992,
14 is a strong statewide network which has sponsored workshops
15 and state and regional conferences, helped grassroots
16 activists, authored two Sludge Advisories, commented
17 on regulations and policies, testified at various hearings,
18 written articles and helped form the National Sludge
19 Alliance.
20 PEN has adopted a Resolution in regard
21 to Municipal Sewage Sludge which guides our activities
22 and which includes the following points:
23 1) Zero Discharge of all toxics and
24 pathogens
25 2) Support of research to reach zero

1 discharge

2 3) Education

3 4) Permittee/landowner will be assumed

4 guilty if the quality of natural resources such as water,

5 air or soil become diminished

6 5) PEN will support green sources composting

7 (grass, leaves, shredded brush)

8 6) PEN will not support mixed composting

9 The PEN Board of Directors has adopted

10 the following definitions, which are the same as those

11 of the International Joint Commission:

12 TOXIC SUBSTANCE: a substance which can

13 cause death, disease, behavioral abnormalities, cancer,

14 genetic mutations, physiological or reproductive mal-

15 functions or physical deformities in any organism or

16 its offspring, or which can become poisonous after

17 concentrating in the food chain or in combination with

18 other substances.

19 PERSISTENT TOXIC SUBSTANCE: any toxic

20 chemical that bioaccumulates, or any toxic chemical

21 that has a half-life greater than eight weeks in any

22 medium (water, air, sediment, soil, or living things).

23 Substances with either of these character-

24 istics should be eliminated.

25 The PEN Board of Directors voted to join

1 the National Sludge Alliance and agreed to sign on to
2 the NSA Mission Statement.
3 (The prepared testimony of Jane E. Beswick,
4 Coordinator, Coalition for Sludge Education is as follows:)
5 May 16, 2000
6 Honorable ARthur D. Hershey, Chairman
7 Environmental Resources & Energy Committee
8 Pennsylvania House of Representatives
9 Harrisburg PA 17120-2020
10 Honorable Raymond Bunt, Jr. Chairman
11 Agricultural and Rural Affairs Committee
12 Honorable Camille "Bud" George, Member
13 Environmental Resources & Energy Committee
14 Subject: Public Hearing - Sewer Sludge
15 (Biosolids), Wednesday, May 17, 2000
16 Dear Sirs:
17 For more than seven years I have been
18 researching the issue of land application of sewer sludge.
19 As members of the National Sludge Alliance, we gather
20 and disseminate information concerning the risks of
21 spreading sewer sludge on farmland. My husband and
22 I have been dairy farmers in Stanislaus County, California
23 since 1966.
24 In March of this year I was invited to
25 testify before the Science Committee of the U.S. House

1 of Representatives about the inappropriate manner in
2 which U.S. EPA treats scientists and citizens who speak
3 out against the adequacy of the 503 rule. That hearing,
4 including the full text of each witness' testimony,
5 is archived on the Science Committee website at
6 www.house.gov/science.
7 I believe there is an intentional Catch
8 22 being perpetrated on citizens and governmental officials
9 by the U.S. EPA. Let me tell you how. The 503 rule
10 was promulgated on the premise that land application
11 was a "low risk" disposal method, therefore, it was
12 given a low priority for enforcement and EPA did not
13 provide funding for monitoring, tracking or enforcement.
14 As a result, at public meetings, EPA and the industry
15 can assert, "There has never been a documented case
16 of a health problem where the material has been spread
17 in accordance with the 503 guidelines.
18 The Inspector General's March 20, 2000
19 audit report of US EPA's Biosolidss Management and Enforce-
20 ment found, "EPA does not have an effective program
21 for ensuring compliance with the land application require-
22 ments of Part 503. Accordingly, while EPA promotes
23 land application, EPA cannot assure the public that
24 current land application practices are protective of
25 human health and the environment." (page ii) EPA's

1 Office of Water (OW) asked for this entire paragraph
2 to be deleted. (See page 45, Report No. 2000-P-10).
3 Further, the OW said, "The real issue,
4 . . .is that EPA and state regulatory agencies cannot
5 provide documentation to determine compliance levels
6 with the Part 503 requirements." Did you catch that?
7 EPA knows the precise problem--compliance cannot be
8 documented. But most of all, and worst of all, neither
9 can noncompliance be documented.
10 EPA has not attempted to gather information
11 concerning problems but private citizens have. The
12 death of Tony Behun is one very sad example. Have you
13 asked Tony's mother whether she feels land application
14 is truly "low risk" as U.S. EPA has assumed?
15 I believe EPA's implementation of the
16 503 rule is a cleverly crafted Catch 22 to facilitate
17 the land application of sewer sludge--assume it's low
18 risk, provide no funding for regulatory oversight, make
19 no provision to document problems and then, since there
20 are then no documented problems, continue to assert
21 it is a low risk disposal option.
22 So long as you allow this to continue
23 with your blessing, EPA may have no documented problems
24 but there will continue to be victims.
25 Thank you for entering my comments into

1 the hearing record.

2 Sincerely,

3 Jane E. Beswick, Coordinator

4 (Prepared testimony of Pennsylvania

5 Environmental Network is as follows:)

6 For the Joint Public Hearing on Land

7 Application of Sewage Sludge in the Commonwealth

8 Before the House Committee on Environmental

9 Resources and Energy and the Committee on Agriculture

10 and Rural Affairs

11 May 17, 2000 Harrisburg PA

12 Delivered by Hand by Tina Daly, Sludge

13 Team Chair, 1880 Pickering Road, Phoenixville, PA 19460

14 The Pennsylvania Environmental Network

15 (PEN) organized in 1989, is a statewide alliance of

16 grassroots environmental groups and individuals fighting

17 for environmental justice. We accomplish our work through

18 Teams, one of which is the Sludge Team. The Sludge

19 Team has existed for about a decade, and is composed

20 of members from all parts of our Commonwealth who have

21 concerns about the negative impacts from land application

22 of sewage sludge. Over the years the Sludge Team has

23 organized and hosted workshops, meetings, and a major

24 multi-state conference in Oil City in 1997. The Chair

25 of the sludge team helped organize the National Sludge

1 Alliance in 1996.

2 As we see it there are three main items

3 to comment on today.

4 Number one is the need for public decision

5 making bodies to allow all voices to be heard. In 1997

6 the 5th Circuit Court of Appeals ruled that there is

7 no consensus among the experts on the safety of land

8 application of sludge. We hope that the Pennsylvania

9 House of Representatives will take heed of that decision

10 and allow testimony to be delivered, in person, by those

11 with opinions from both sides of the issue.

12 Number two is the issue of present attempts

13 to preempt townships from passing ordinances that protect

14 the health, safety and welfare of their residents. These

15 ordinances do not control, restrict or ban the use of

16 sewage sludge. PEN wants to be sure that townships

17 have the continued right to pass such protective ordinances.

18 Number three are the larger issues related

19 to the land application of sewage sludge.

20 OPEN HEARINGS

21 We are disturbed that these hearings

22 were advertised as "Joint Public Hearings" of two important

23 House Committees, when in fact the public will not be

24 permitted to speak. We wrote and requested to be able

25 to speak but by letter were denied time. It is too

1 bad that there are members of these Committees who do
2 not want to hear both sides of the sludge issue. Whatever
3 happened to the democratic process in Pennsylvania?
4 There is no doubt that PEN's Sludge Team
5 is the premier group working on sludge issues in this
6 state. We have spent a decade educating and informing
7 ourselves and others about the issue at hand.
8 PEN's Sludge Team believes that all public
9 issues must be thoroughly discussed in public and that
10 the public must be permitted to be part of the decision
11 making process. Management of sewage sludge is a public
12 issue. The PA DEP claims that sludge issues are very
13 technical and scientific. We believe there is a lot
14 of smoke here and a lot of "political" science. This
15 is about getting rid of a very unpleasant waste material.
16 It is about dumping on the poor, on rural areas and
17 on mining land. PEN believes that we do not have to
18 depend on the opinions of industry's scientists and
19 technicians. There is a large and growing body of scienti-
20 fic literature that questions the wisdom and safety
21 of land application and beneficial use. We believe
22 that the citizens of this Commonwealth are sophisticated,
23 knowledgeable and fully capable of making comments on
24 this issue.
25 PRE-EMPTION

1 DEP, through their Biosolids Education
2 Workgroup, has been working very closely with the PA
3 Water Environment Federation, pro-sludge industry group.
4 This workgroup has posted their minutes on the web.
5 The 1-20-00 minutes include an article about how the
6 workgroup wants to ask the DEP's Legislative Liaison
7 to take an industry document to the Legislature. This
8 document, entitled "Biosolids Recycling in Pennsylvania:
9 The Impact of Local Ordinances" is authored by the PA-
10 WEF and the PSMA (PA Septage Management Association)
11 and points out that local ordinances are not necessary
12 and are a bad precedent for other waste issues.
13 The US EPA's 503 regulations made specific
14 provisions for local control. See 40 CFR Section 503.5.
15 No matter what each of us may know or
16 think about the land application of sewage sludge, surely
17 we can all agree that pre-emption of local control is
18 very dangerous. We are opposed to pre-emption of local
19 ability to pass protective ordinances. We demand public
20 participation at all levels of government in public
21 decision making. Our democratic processes are being
22 eroded. Why can't Committee members hear both sides
23 of this issue? Why does the DEP's Biosolids Education
24 Workgroup want taxpayers to foot the bill for a Biosolids
25 Public Relations Academy that would develop a training

1 program for generators and appliers in conducting quality
2 public relations concerning biosolids beneficial use?
3 How can both sides be heard when DEP goes forth, hand
4 in hand with the regulated, to spread pollutants across
5 our state? EPA has given the WEF $300,000 to be used
6 to enhance the image of sludge and promote its use.
7 Why is it necessary to promote the use of pollutants?
8 Rush Township in Clearfield County passed
9 an ordinance allowing them to place a tipping fee to
10 protect the population's health and safety. Their ordinance
11 is now being challenged by a division of a giant waste
12 company. These ordinances do set a standard and apparently
13 it is one that the sludge industry does not like.
14 SEWAGE SLUDGE
15 PEN's Sludge Team believes that problems
16 stemming from municipal sewage sludge management are
17 indicative of all waste management issues. Agricultural
18 utilization, landfilling, composting, incineration,
19 use as an alternative fuel, land reclamation and so
20 forth are various ways to redistribute toxics that are
21 in sludge into sediments, soil, air, water, animals
22 and living things. Most sludges are laden with heavy
23 metals, radioactive isotopes and pathogens and until
24 they are cleaned up, need to be regulated and managed.
25 As long as sewers are used for waste

1 disposal there will be toxic sewage sludge. Nothing
2 can be truly disposed of; it can only be managed, contained
3 or redistributed. Everything has to go somewhere; there
4 is no such thing as "away." We do not want these pollutant
5 laden materials to be distributed all over our Commonwealth.
6 We believe the long range solution to
7 managing toxic municipal sewage sludge lies at the front
8 end of the pipe: the Clean Water Act calls for zero
9 discharge. We support that and also call for toxics
10 use reduction; we must change the way we do things and
11 we must use fewer and less toxic materials. A POTW
12 is a place to which polluters can send wastes that then
13 get mixed together and thus cannot be traced back to
14 their source. In one sense a POTW is a kind of liability
15 laundry for polluters.
16 Sludge is the accumulated solids concentrated
17 during the treatment of a community's wastewater. The
18 contents of sludge are determined by the composition
19 of the wastewater that comes into the treatment plant
20 from households, businesses, industries, institutions
21 including hospitals and research labs, and from storm
22 sewers. Toxics in wastewater can pass through the treatment
23 process and continue to contaminate sludge.
24 Some of the pollutants typically found
25 in sludge are: PCB's, pathogens, radioactive isotopes,

1 chlorinated compounds, polynuclear aromatic hydrocarbons,
2 chlorinated pesticides, dioxin and heavy metals. Enough
3 is known about how these contaminants interact with
4 each other and with air, water, soil, sediment and living
5 things to cause us great concern. There are 60,000
6 or more chemicals and chemical combinations that could
7 be in sludge. Sludge is literally a toxic soup.
8 The Clean Water Act, Sec. 503 sets standards
9 for sludge. At this time the PA DEP regulations mimic
10 the Sec. 503 standards plus they regulate PCBs. Radio-
11 activity is not regulated. Dioxins are not regulated
12 although there is a poorly written weak proposal to
13 do so.
14 The US District Court for the Southern
15 District of California ruled that the Clean Water Act
16 defines sewage sludge as a pollutant. (DC#96-0804-
17 JNK). The US Court of Appeals in the Ninth Circuit
18 Court ruled that "the District Court was correct that
19 the statutory definition of "pollutant" controls. In
20 USA v. Cooper, a citation states "the regulations also
21 make clear that land application of sewage sludge still
22 carries with it some risks; it is after all, a pollutant."
23 (Welch v. Board of Supervisors, 888F, Suppl 753 (WD
24 Va 1995).
25 Ocean dumping of sewage sludge was banned

1 because it was destroying the marine environment. In
2 exchange for stopping ocean dumping, several large private
3 conservation organizations signed a consent decree agreeing
4 not to hinder the EPA's plan to promote land application.
5 Land application of sewage sludge is the least expensive
6 form of disposal. Land application involves the moving
7 of liability for adverse impacts from the polluter to
8 the landowner. In many cases, farm liability insurance
9 policies do not cover contamination caused by sludge
10 application to farmland.
11 At this time, the EPA's regulations are
12 coming under scrutiny and scientists who question them
13 are being heard. There is an ever increasing list of
14 victims who have been hurt by the land application of
15 sludge. Yet, the sludge industry likes to claim there
16 has never been a documented case of harm to health or
17 the environment when sludge has been applied in accordance
18 with the rules. The problem is that there is no monitoring
19 and there is no way to know if the rules have been followed.
20 Oversight is inadequate to nonexistent. Thus, local
21 governments are stepping in with ordinances to protect
22 the health of their constituents. The EPA has never
23 looked into any of the victim's complaints.
24 Sludge is being land applied in Pennsylvania
25 both on agricultural lands and on mining lands. DEP

1 allows general permits for sludge and also allows beneficial
2 use of this toxic laden material. General permitting
3 is a way of keeping the public out of the decision making
4 process. We are at a loss to understand how polluted
5 materials can be beneficially used; regulations and
6 linguistic detoxification do not change toxicity.
7 At this time, the PA DEP is working on
8 proposed changes to the Municipal Waste Regulations,
9 the Residual Waste Regulations and the Water Quality
10 Regulations. Hearings were held in the fall of 1998
11 and we have not yet seen the next round of proposed language.
12 It can be safely said that PA DEP is deregulating sludge
13 and that all three of these regulations impact on the
14 practice of land application of sludge.
15 One of the concerns we have is about
16 radioactive materials in sludge and the fact that they
17 are unregulated. According to a 1994 GAO report the
18 extent of radioactivity in sewer plants could not be
19 determined. EPA is presently doing a study of this
20 but the public has not been permitted to see the study.
21 It is our understanding that EPA had to allow the POTW's
22 in the study to remain anonymous. This GAO Report also
23 covers the radioactive sludge found at the Royersford,
24 PA sewage treatment plant.
25 The National Sludge Alliance and other

1 groups are presently seeking an injunction regarding
2 leachates from the Lowry Landfill Superfund site that
3 may be sent to the Denver Metro POTW. The sludge that
4 results from this is used on wheat fields, and the wheat
5 sold on the open market. There are radioactive materials
6 in this leachate. This is a very important case because
7 of the Nuclear Regulatory Commission's plans to release,
8 recycle and reuse radioactive wastes and allow them
9 into the everyday waste stream which means many of them
10 will end up down the drain and find their way into sludge.
11 Health issues are of paramount concern
12 to PEN. Recently Joe Cocalis, an industrial hygienist
13 with the National Institute of Occupational Safety and
14 Health of the CDC said, in sworn testimony, that the
15 position currently being taken by the EPA concerning
16 sludge is "indefensible from a public health standpoint."
17 In addition, the EPA Inspector General
18 has stated that "EPA does not have an effective program
19 for insuring compliance with the land application require-
20 ments of Part 503. Accordingly, while EPA promotes
21 land application, EPA cannot assure the public that
22 current land application practices are protective of
23 human health and the environment."
24 There are all sorts of health issues
25 that can occur from the land application of sludge and

1 sludge products. EPA and DEP doe not provide documentation
2 to determine compliance with the 503 requirements. EPA
3 insists that land application of sludge is a low risk
4 operation and, therefore, they do not need to document
5 problems and noncompliance. This means that they have
6 no way of knowing if their rules are followed and no
7 way to know if harm is caused. How can EPA know that
8 the regulations have been followed when they do not
9 have people monitoring the process? How can they assert
10 there has never been a documented problem?
11 Today, PEN is hosting a Press Conference
12 at the Rotunda featuring David L. Lewis, PhD research
13 microbiologist for the EPA and currently assigned to
14 the University of Georgia. Dr. Lewis is to appear in
15 his private capacity to speak about the death of Tony
16 Behun, an 11 year old Pennsylvanian who died after exposure
17 to sludge. Dr. Lewis reviewed this child's medical
18 records and has found that he died from an infection
19 of staphylococcus aureus, one of the pathogens listed
20 by the EPA as posing a public health threat from sewage
21 sludge. We were fortunate in being able to bring Dr.
22 Lewis to our state to help us make known the health
23 dangers of land application.
24 In closing, I want to remind you that
25 Pennsylvanians are proud to be caretakers of this great

1 agricultural state. We spend a lot of time these days
2 saving farms and open space and preserving all the land
3 we can. We hope this is not to be used for land
4 application of sludge although we know this happens.
5 We must protect our land, air, water and the very soil
6 we depend on to grow crops for our own use and for
7 importation to others who rely on us for clean and healthful
8 food.
9 We implore you to protect our rights
10 to a healthy environment. The sludge rules are a sham.
11 The hearings today were a sham. Please, decide to listen
12 to all of us and to rethink this Commonwealth's sludge
13 policy. Please enter this into the hearing record.
14 We would like to end with a quote from
15 Rachel Carson.
16 "The most alarming of all man's assaults
17 upon the environment is the contamination of air, earth,
18 rivers and seas with dangerous and even lethal materials."
19 (Prepared testimony of Susan Ensinger
20 is as follows:)
21 May 16, 2000
22 To: Public Hearing on Land Application
23 of Sewage Sludge House Agriculture and Rural Affairs
24 Committee and House Environmental Resources and Energy
25 Committee

From: Susan Ensinger
PO Box 233
Lenhartsville, PA 19534

In the summer of 1997, land near my home in Berks County started being sludged. The farmer grows hay and is a no-till farmer so this sludge was not incorporated into the soil. The odor was horrendous. Neighbors could not open their windows during the summer heat or hang their wash outdoors. As I learned more about sludge and the federal and state governments approval and encouragement of this practice, the more concerned I became about my health and the degradation of the environment. I find it incomprehensible that government states it wants clean water and air and safe food while at the same time encouraging the spread of heavy metals, persistant organic pollutants, dioxins, tens of thousands of chemicals, bacteria, and other pathogens on farmland. Sewage sludge is the concentration of everything that goes into an urban sewage system. Pennsylvania is creating toxic sites on its farms. Sludge is toxic and needs to be landfilled where it can be contained.

Land application of sludge is a cheap disposal method for sewage treatment plants at the expense of those living in rural areas. Permitting 264 lbs of lead per acre to be added to agricultural land through

1 sludging is not recycling. The risks from pollutants
2 and toxic substances far outweigh any beneficial use
3 as fertilizer. I encourage you to read "The Case for
4 Caution" by Cornell Waste Management Institute, Cornell
5 University. The conclusion of this paper is that federal
6 regulations do not appear "adequately protective of
7 human health, agricultural productivity, or ecological
8 health." The paper points out flaws in EPA's risk
9 assessment studies. It also emphasizes that Canada
10 and European countries have significantly more stringent
11 regulations for amounts of contaminants allowed in sludge
12 applied to land. The paper particularly calls for caution
13 in the northeast part of the country because of certain
14 conditions such as shallow acid soil, amount of precipitation,
15 and abundance of streams. Not only are the regulations
16 inadequate, but I found that the enforcement of them
17 in Pennsylvania is left mainly in the hands of sewage
18 treatment plants and sludge haulers--those who have
19 economic interest in doing as much land application
20 as possible. In my neighborhood,a sludge hauler was
21 spreading sludge the day before Hurricane Floyd hit
22 the area in September of 1999. It had already begun
23 to rain. If neighbors hadn't complained, DEP and Berks
24 Conservation District would not have been aware of
25 the runoff from this into a stream. We can't depend

on sludge haulers to obey regulations.

The sludge haulers threaten to and do take municipalities to court when municipal governments attempt to give some protection to their residents. These sludge haulers are part of national and international companies. Their resources for legal battles are far greater than those municipalities with only a couple of thousand residents.

I and my neighbors have a right to clean air and water, but no monitoring of the air or well water is done by DEP in our neighborhood to assure us that sludging is not adversely affecting these. No one is monitoring the effect on wildlife and ecology. The insects, mammals, reptiles, and birds do not know that they should stay off sludged land for thirty days after its application.

I'm outraged at this purposeful contamination of our rural areas. The mentality that it's ok for those in rural areas to live with toxins from sludge, but not those in residential areas puzzles me. Buffers of 100 feet are not sufficient to protect us from hundreds of sludged acres.

Fortunately, many farmers in my township have the good sense not to use sludge. Only two have and these two do not live in the township nor do they

1 sludge where they live.

2 At least six counties in Virginia have

3 banned sludging. Several food processors such as Del

4 Monte and Heinz do not buy produce grown in sludge.

5 I urge you to rethink land application

6 of sewage sludge in Pennsylvania. This practice is

7 detrimental to human health, wildlife, and ecology.

8 The results of the risks may take years to become apparent

9 and then it will be too late for Pennsylvania's agricultural

10 land.

11 (Prepared testimony of Judith A. Fasching

12 is as follows:)

13 May 17, 2000

14 Dear Sir or Madam:

15 Since we were not allowed to talk at

16 this public hearing today, please accept the attached

17 as my testimony. I look forward to your personal reply.

18 Judith A. Fasching

19 Michael L. Fasching

20 440 Creek Lane

21 Lenhartsville, PA 19534

22 (610) 562-0172

23 jfasching913@cs.com

24 Approximately 6 years ago, my husband

25 and I passed a local trucking company. My husband said

1 "those trucks haul sludge. That is nasty stuff." I
2 asked him "what is sludge?" He said "human waste."
3 End of conversation.
4 It has been almost 3 years ago on July
5 7, 1997; we received a letter in the mail from BFI notifying
6 us they will be spreading sludge on a neighboring farm.
7 Our first reaction was, "Oh, no they won't." Never
8 in my life did we imagine we would have no rights to
9 be able to live in a healthy environment. Never in
10 my life did we ever imagine that the government agencies
11 that we thought were there to protect us are actually
12 allowing us to be poisoned slowly but surely. After
13 many phone calls, I realized I was in for a challenge.
14 But, let me assure you, I am not a quitter.
15 The DEP's rules are that sludge must
16 be tilled under within 24 hours, unless it is spread
17 on a no-till farm. Then it does not have to be tilled
18 under. This contradiction alone scares the hell out
19 of me. My husband and I happen to be one of the unlucky
20 ones that live by a no-till farm. Let me tell you of
21 our summer last year. Near the end of June this farmer
22 started having the sludge spread. For 3 weeks we were
23 subjected daily to the awful odors being emitted from
24 the sludge. We are fortunate to have air conditioning
25 where we could retreat to our home without the foul

odors following us. Not all the neighbors are as fortunate, and they had nowhere to go to escape the stench. Then I asked myself, why can't I enjoy the outdoors at my own home, open windows, hang wash, and have picnics. Why must I be afraid to drink my well water out of fear of pollution from the sludge? Why must I be afraid to breathe out of fear of airborne pathogens? What are my rights? I have requested that DEP test our well, and they refused. We have a shallow well, which is more susceptible to runoff and pollution. We have bought bottled water since the sludging started two years ago. We have been advised by two attorneys that we have a good nuisance case and would most likely win. But unfortunately these cases get complicated and we would need $30 to $50,000 up front, which the average homeowner cannot afford.

The same farmer owns several farms in the area. He spreads sludge on every farm his family owns, except the one where he lives. A neighbor by another one of his farms has Lupus, and her body cannot tolerate anything toxic. After the sludge was spread by their house, she became ill with constant headaches. A few days after they left for vacation, she started vomiting. Her body was purging the toxins. Some of the sludge washed on to their property and last year

1 no sludge was spread on that farm due to her condition.
2 The goal of sewage treatment is to clean
3 up the water; so many contaminants are removed from
4 the water and concentrated in the sludge. It is estimated
5 that about 90% of the dioxins in the incoming water
6 will end up in the sludge. Parasite eggs settle and
7 are concentrated in sludge. This is beneficial in providing
8 cleaner water discharge from the treatment plant, but
9 makes beneficial use of the sludge more difficult.
10 The mix of chemicals, heavy metals, and
11 pathogens includes contaminants that are detrimental
12 to human health. Many of these added contaminants are
13 persistent and once applied will remain in the soil
14 and ecosystem for many years. Regulations do not require
15 monitoring of dioxins, numerous other hazardous chemicals
16 or radioactivity. Sludge does not have to be plowed
17 under and remains on top of the soil where particulate
18 from it can become airborne. Air quality is not monitored.
19 Sludge can be spread as close as 100 feet to a stream
20 and 300 feet of a residential well. These streams and
21 wells are not monitored for contamination from sludge.
22 Livestock cannot graze on land for 60 days after sludge
23 is applied, but wildlife continue to feed on this land.
24 While the government has required lead to be eliminated
25 from gasoline and other products, why does it encourage

1 sludge with lead to be put on agricultural land? The
2 long-term effects of spreading sewage sludge on land
3 have not been sufficiently studied.
4 Dumping sludge on farmland is the cheapest
5 disposal; there is NO LIABILITY on the part of the business,
6 sewer authority, or farmer. If this same sludge is
7 land filled or incinerated, everyone down the line IS
8 liable IF the expensive case for liability can be proven.
9 Current EPA and DEP regulations are not stringent enough
10 to protect our environment and us and rely too heavily
11 on generators and haulers of sludge to monitor the
12 pollutants in it.
13 While a few people--in and out of government
14 --make millions of dollars under the guise of ridding
15 us from sewage, the rest of us are giving up our rights
16 to a healthy life. This practice threatens our water
17 and food supply, air quality, health, and property values.
18 In closing, I would like to add that
19 the trucking company I mentioned at the beginning of
20 my testimony was one of the companies hired to haul
21 sludge to farms. They have since had many charges filed
22 against them by the Attorney General's Office. Some
23 of the charges are illegally hauling hazardous waste
24 and falsifying insurance records. The indictment against
25 them alleges the company amassed the worst safety record

of all 23,000 Pennsylvania trucking companies regulated by the Federal Highway Administration.

I hereby certify that the proceedings and evidence taken by me in the within matter are fully and accurately indicated in my notes and that this is a true and correct transcript of the same.

Dorothy M. Malone

Dorothy M. Malone, RPR
135 S. Landis Street
Hummelstown PA 17036

The foregoing certification of this transcript does not apply to any reproduction of the same by any means unless under the direct control and/or supervision of the certifying reporter.