# Bill as Introduced

SB 218-FN-LOCAL – AS INTRODUCED

1999 SESSION

99-0951
08/10

SENATE BILL ***218-FN-LOCAL***

AN ACT regulating the land application of sewage sludge.

SPONSORS: Sen. Wheeler, Dist 21; Sen. D'Allesandro, Dist 20; Sen. Disnard, Dist 8; Sen. Russman, Dist 19; Sen. Cohen, Dist 24; Rep. B. Hall, Hills 20; Rep. Owen, Merr 6

COMMITTEE: Environment

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ANALYSIS

This bill establishes:

I. Notice requirements for persons who land apply sludge.

II. Record keeping requirements for haulers of sludge.

III. A prohibition on wastewater treatment plants from excluding towns that regulate sludge disposal within their borders.

IV. Limitations to land application of sludge including sludge containing dioxins.

V. Requirements for persons or facilities acquiring sludge quality certification requirements.

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Explanation: Matter added to current law appears in ***bold italics.***
Matter removed from current law appears [~~in brackets and struckthrough.~~]
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

99-0951
08/10

STATE OF NEW HAMPSHIRE

*In the Year of Our Lord One Thousand Nine Hundred and Ninety-Nine*

AN ACT regulating the land application of sewage sludge.

*Be it Enacted by the Senate and House of Representatives in General Court convened:*

1 New Paragraphs; Notice of Septage or Sludge Spreading. Amend RSA 485-A:5-c by inserting after paragraph III the following new paragraphs:

IV. If the proposed land application area is in a residential area, or if residential, commercial, or institutional buildings are located within 200 feet of the proposed land application area, written notice of such application shall be submitted in person to all persons owning property and other persons using commercial, institutional or residential buildings within the application area or 200 feet of the intended treatment area at least 14 days but not more than 60 days before the commencement of the proposed sludge land application. The notice shall contain the following information:

(a) Description of the treatment area sufficient to inform people who may be in the vicinity.

(b) Name of the person who contracted for the application or such person's representative or the applicator, and the address and telephone number to contact for more specific information about the intended application.

(c) Intended purpose of the sludge application.

(d) Date or reasonable range of dates on which such application is proposed to take place.

(e) Telephone number of the New Hampshire department of environmental services, division of water.

V. For absentee property owners, notice by certified mail, return receipt requested, to the address listed in the town tax record shall be sufficient notice.

VI. Any person who land applies sludge that is not low metal, or who owns land on which such sludge is land applied, shall record in the registry of deeds a notice which shall contain:

(a) The date on which the department issued the sludge quality certificate pursuant to which the sludge was land applied and the expiration date of said sludge quality certificate.

(b) The name and address of each facility from which the sludge was obtained.

(c) Each facility that land applies sludge that is not low metal shall, in addition to the requirements of subparagraphs (a) and (b), include in such record the content of the sludge as stated in the most recent analysis thereof and the dates on which such analysis was conducted.

2 Land Application of Sludge. Amend RSA 485-A:5-d to read as follows:

485-A:5-d Land Application of Sludge

*I.* Sludge or biosolids which are to be land applied in New Hampshire shall not exceed the maximum concentrations for specific chemical contaminants contained in the rules of the department, or the rules or regulations of the state in which the sludge was generated, whichever are more stringent.

***II. Sludge that is applied to land used for grazing animals or land upon which one or more forage crops grow or are intended to be grown shall not contain more than 10 parts per million of molybdenum.***

***III. Sludge shall not be land applied to forestland, as defined in RSA 227-G:2, VIII, or in newly clearcut areas.***

***IV. Solid waste or hazardous waste, as these are defined in RSA 149-M and 147-A, respectively, shall not be disposed of in the form of sludge in a site or facility permitted by the department's sludge management rules.***

***V. A soil pH reading of between 6.5 and 7.0 shall be maintained for such soil during land application activities and for 5 years after the last application to such land.***

***VI. A minimum buffer distance shall be maintained between land applied sludge and surface waters of the state, as defined in RSA 485-A:2, XIV. The minimum buffer distance shall be 250 feet from the high water mark.***

***VII. A minimum distance of 3 feet shall be maintained between bedrock and the lowest point of land application of sludge.***

***VIII. Sludge shall not be stockpiled or land applied on 100 year flood plains. Stockpiles may be placed on sites that are not flood plains up to and including 30 days before any planting or seeding. Sludge shall not be stockpiled where there is less than 4 feet of unsaturated soil between the lowest point of such storage and the maximum high groundwater table.***

***IX. Sludge shall not be applied to agricultural land which has a slope greater than 8 percent.***

3 New Sections; Sludge Quality Certification Requirements. Amend RSA 485-A by inserting after section 5-d the following new sections:

485-A:5-e Sludge Quality Certification Requirements.

I. All publicly owned treatment works (POTWs) who land apply sludge shall list all industrial waste water contributors and chemical constituents of their waste water.

II. As of January 1, 2001, the following maximum metal concentrations shall be required by any wastewater treatment facility if such facility shall be issued a sludge quality certification by the department:

(a) If the sludge is to be certified as a low-metals sludge, the following maximum concentrations, expressed as the total concentration on a dry weight basis:

(1) For arsenic, 10 mg/kg.

(2) For cadmium, 10 mg/kg.

(3) For chromium, 160 mg/kg.

(4) For copper, 1000 mg/kg.

(5) For lead, 270 mg/kg.

(6) For mercury, 7 mg/kg.

(7) For molybdenum, 18 mg/kg.

(8) For nickel, 98 mg/kg.

(9) For selenium, 18 mg/kg.

(10) For zinc, 1780 mg/kg.

(b) For all other sludge, the following maximum concentrations shall apply, expressed as the total concentration on a dry weight basis:

(1) For arsenic, 32 mg/kg.

(2) For cadmium, 14 mg/kg.

(3) For chromium, 1000 mg/kg.

(4) For copper, 1500 mg/kg.

(5) For lead, 300 mg/kg.

(6) For mercury, 10 mg/kg.

(7) For molybdenum, 35 mg/kg.

(8) For nickel, 200 mg/kg.

(9) For selenium, 28 mg/kg.

(10) For zinc, 2500 mg/kg.

(11) For polychlorinated biphenyls (PCBs), 1.0 mg/kg.

(12) For dibenzodioxins and dibenzofurans, 10 ng/kg TEQ for 2,3,7,8 TCDD and 2,3,7,8 TCDF; and 27 ng/kg for all congeners determined by EPA method 1613 using the 1989 toxic equivalency factors.

III. Each water treatment facility holding a sludge certification shall have sludge from its treatment facility analyzed annually for constituents as required by rules adopted by the commissioner, and shall submit such test results to the department annually.

IV. Sludge quality certifications shall expire 2 years from the date of issuance.

V. University of New Hampshire cooperative extension services best management practices with regard to agronomic application rates of sludge shall be adhered to by any person who land applies sludge.

485-A:5-f Sludge Containing Dioxins. The following limitations shall apply to the land application of sludge containing dioxins, in addition to all other rules and laws applying to the land application of sewage sludge:

I. Animals shall not be grazed on land on which sludge containing dioxins has been applied until 12 months after the last application of such sludge.

II. Sludge and residuals containing PCDDs and PCDFs shall not be applied to land on which crops for human consumption are grown. In this paragraph, crops for human consumption means all vegetable and fruit crops that are consumed by humans.

III. No pasturing of livestock and fowl whose products are consumed by humans shall occur on fields that receive sludge or residuals containing PCDDs and PCDFs.

IV. The restrictions in this section on pasturing of livestock or fowl whose products are consumed by humans and growing crops and fruits intended for human consumption shall apply to subsequent purchasers of the land utilization site. It shall be the responsibility of the utilization site licensee, landowner, or any subsequent landowner to notify any purchaser of such land that sludge or residuals containing PCDDs and PCDFs have been applied to that site and that subsequent owners are subject to use restrictions under this regulation.

V. When filing an application for sludge and residuals utilization with the department, the applicant shall submit a copy of a statement signed by the landowner and, if different, the operator of the site, that specifically acknowledges the presence and concentrations of PCDDs and PCDFs in the material to be spread, and the ability and willingness of the landowner to comply with all rules and laws governing the land application of sludge containing PCDDs and PCDFs.

485-A:5-g Required Record Keeping for Land Application of Sludge.

I. Each sludge hauler permit holder shall record the following information, on a form provided by the department, for each load of sludge:

(a) The date the sludge is transported from the generator's site or facility.

(b) The generator's name, address, and telephone number.

(c) The quantity of sludge, in wet tons.

(d) The type of sludge, such as domestic or industrial.

(e) The name, address, and telephone number of the hauler permit holder and driver of the motorized vehicle.

(f) The name, address, and telephone number of the sites, facilities, solid waste facilities, or wastewater treatment facilities to which the sludge is to be delivered.

(g) The date delivered to the sites or facilities.

II. The information required in paragraph I shall be maintained in the motorized unit used to transport the sludge when the sludge is being transported.

III. Records required under this section shall be maintained on a permanent basis.

485-A:5-h Exclusion of Use by Towns that Regulate Prohibited. No wastewater treatment plant shall exclude a town from using its facility solely for the reason that the town exercises its rights under applicable state laws to regulate sludge disposal within its borders.

4 Effective Date. This act shall take effect 60 days after its passage.

LBAO
99-0951
2/23/99

## SB 218-FN-LOCAL - FISCAL NOTE

AN ACT regulating the land application of sewage sludge.

**FISCAL IMPACT:**

The Department of Environmental Services stated this bill will decrease state restricted revenue by $11,000 in FY 2000 and each year thereafter. Local expenditures will increase by $1,160,800 in FY 2000, by $1,219,400 in FY 2001, by $1,280,900 in FY 2002 and by $1,345,500 in FY 2003. There will be no fiscal impact on county and local revenue or state and county expenditures.

**METHODOLOGY:**

The Department assumed this bill will take effect July 1, 1999, and that due to the increased cost of sludge analysis, additional site and setback restrictions, and additional site management constraints, this bill would effectively eliminate land application of Class B sludge from the 17 New Hampshire municipalities who follow this practice, as well as from the 5 out-of-state facilities which currently bring sludge into New Hampshire, and the sludge would be landfilled. State restricted revenue and local expenditures will decrease by $11,000 (22 municipalities x $500) as the random inspection and testing fee will no longer be paid. The increased cost, calculated in June of 1998, of disposal at landfills over land application is $60 per wet ton. Based on a 1996 survey, the total amount of sludge being land applied is approximately 18,600 wet tons. Tipping fees will increase by 5% per year.

# Amendments

Sen. Wheeler, Dist. 21
March 31, 1999
1999-0674s
08/10

Amendment to SB 218-FN-LOCAL

Amend RSA 485-A:5-d as inserted by section 2 of the bill by replacing it with the following:

485-A:5-d Land Application of Sludge

*I.* Sludge or biosolids which are to be land applied in New Hampshire shall not exceed the maximum concentrations for specific chemical contaminants contained in the rules of the department, or the rules or regulations of the state in which the sludge was generated, whichever are more stringent.

***II. Class B sludge that is applied to land used for grazing animals or land upon which one or more forage crops grow or are intended to be grown shall be immediately incorporated into the soil. Such sludge shall not contain more than 10 ppm of molybdenum.***

***III. Class B sludge shall not be land applied to forestland, as defined in RSA 227-G:2, VIII, or in newly clearcut areas.***

***IV. Class B sewage sludge and industrial paper mill sludge shall not be used to reclaim spent gravel pits above aquifers.***

***V. A soil pH reading of between 6.5 and 7.0 shall be maintained for such soil during land application activities and for 5 years after the last application to such land.***

***VI. A minimum buffer distance shall be maintained between land applied class B sludge and surface waters of the state, as defined in RSA 485-A:2, XIV. The minimum buffer distance shall be 250 feet from the high water mark.***

***VII. A minimum distance of 3 feet shall be maintained between the seasonable high water table and the lowest point of land application of sludge.***

***VIII. Class A and class B sludge shall not be stockpiled or land applied on 100 year flood plains. Stockpiles may be placed on sites that are not flood plains up to and including 30 days before any planting or seeding. Sludge shall not be stockpiled where there is less than 4 feet of unsaturated soil between the lowest point of such storage and the maximum high groundwater table.***

***IX. Class B sludge shall not be applied to agricultural land which has a slope greater than 8 percent.***

***X. Deliveries of class A sludge exceeding 20 tons per site per year shall be reported to the department.***

Amend RSA 485-A:5-e as inserted by section 3 of the bill by replacing it with the following:

485-A:5-e Sludge Quality Certification Requirements.

I. All publicly owned treatment works (POTWs) who land apply sludge shall list all industrial waste water contributors and chemical constituents of their waste water.

II. As of January 1, 2001, the following maximum metal concentrations shall be required by any wastewater treatment facility if such facility shall be issued a sludge quality certification by the department:

(a) For arsenic, 10 mg/kg.

(b) For cadmium, 10 mg/kg.

(c) For chromium, 160 mg/kg.

(d) For copper, 1000 mg/kg.

(e) For lead, 270 mg/kg.

(f) For mercury, 7 mg/kg.

(g) For molybdenum, 18 mg/kg.

(h) For nickel, 98 mg/kg.

(i) For selenium, 18 mg/kg.

(j) For zinc, 1780 mg/kg.

III. Sludge quality certifications shall expire 2 years from the date of issuance.

IV. University of New Hampshire cooperative extension services best management practices with regard to agronomic application rates of sludge shall be adhered to by any person who land applies sludge.

Amend RSA 485-A:5-f as inserted by section 3 of the bill by replacing it with the following:

485-A:5-f Sludge Containing Dioxins. The following limitations shall apply to the land application of sludge containing dioxins, in addition to all other rules and laws applying to the land application of sewage sludge:

I. No pasturing of livestock and fowl whose products are consumed by humans shall occur on fields that receive sludge or residuals containing dioxins TEQ above 1 ppt.

II. The restrictions in this section on pasturing of livestock or fowl whose products are consumed by humans shall apply to subsequent purchasers of the land utilization site. It shall be the responsibility of the utilization site licensee, landowner, or any subsequent landowner to notify any purchaser of such land that sludge or residuals containing dioxins TEQ above 1 ppt have been applied to that site and that subsequent owners are subject to use restrictions under this regulation.

III. When filing an application for sludge and residuals utilization with the department, the applicant shall submit a copy of a statement signed by the landowner and, if different, the operator of the site, that specifically acknowledges the presence and concentrations of dioxins TEQ above 1 ppt in the material to be spread, and the ability and willingness of the landowner to comply with all rules and laws governing the land application of sludge containing dioxins TEQ above 1 ppt.

1999-0674s

AMENDED ANALYSIS

This bill establishes:

I. Notice requirements for persons who land apply sludge.

II. Record keeping requirements for haulers of sludge.

III. A prohibition on wastewater treatment plants from excluding towns that regulate sludge disposal within their borders.

IV. Limitations to land application of sludge including sludge containing dioxins.

V. Specific requirements and limitations for the land application of class A and class B sludge.

VI. Requirements for persons or facilities acquiring sludge quality certification requirements.

Not accepted

Sen. Wheeler, Dist. 21
March 31, 1999
1999-0674s
08/10

IF this amendment is adopted by the Committee, please deliver to the House Clerk (Room 317) or Senate Clerk (Senate Chamber), the 2 originals and 2 copies.

Amendment to SB 218-FN-LOCAL

Amend RSA 485-A:5-d as inserted by section 2 of the bill by replacing it with the following:

485-A:5-d Land Application of Sludge

*I.* Sludge or biosolids which are to be land applied in New Hampshire shall not exceed the maximum concentrations for specific chemical contaminants contained in the rules of the department, or the rules or regulations of the state in which the sludge was generated, whichever are more stringent.

***II. Class B sludge that is applied to land used for grazing animals or land upon which one or more forage crops grow or are intended to be grown shall be immediately incorporated into the soil. Such sludge shall not contain more than 10 ppm of molybdenum.***

***III. Class B sludge shall not be land applied to forestland, as defined in RSA 227-G:2, VIII, or in newly clearcut areas.***

***IV. Class B sewage sludge and industrial paper mill sludge shall not be used to reclaim spent gravel pits above aquifers.***

***V. A soil pH reading of between 6.5 and 7.0 shall be maintained for such soil during land application activities and for 5 years after the last application to such land.***

***VI. A minimum buffer distance shall be maintained between land applied class B sludge and surface waters of the state, as defined in RSA 485-A:2, XIV. The minimum buffer distance shall be 250 feet from the high water mark.***

***VII. A minimum distance of 3 feet shall be maintained between the seasonable high water table and the lowest point of land application of sludge.***

***VIII. Class A and class B sludge shall not be stockpiled or land applied on 100 year flood plains. Stockpiles may be placed on sites that are not flood plains up to and including 30 days before any planting or seeding. Sludge shall not be stockpiled where there is less than 4 feet of unsaturated soil between the lowest point of such storage and the maximum high groundwater table.***

***IX. Class B sludge shall not be applied to agricultural land which has a slope greater than 8 percent.***

***X. Deliveries of class A sludge exceeding 20 tons per site per year shall be reported to the department.***

Amend RSA 485-A:5-e as inserted by section 3 of the bill by replacing it with the following:

485-A:5-e Sludge Quality Certification Requirements.

I. All publicly owned treatment works (POTWs) who land apply sludge shall list all industrial waste water contributors and chemical constituents of their waste water.

II. As of January 1, 2001, the following maximum metal concentrations shall be required by any wastewater treatment facility if such facility shall be issued a sludge quality certification by the department:

(a) For arsenic, 10 mg/kg.

(b) For cadmium, 10 mg/kg.

(c) For chromium, 160 mg/kg.

(d) For copper, 1000 mg/kg.

(e) For lead, 270 mg/kg.

(f) For mercury, 7 mg/kg.

(g) For molybdenum, 18 mg/kg.

(h) For nickel, 98 mg/kg.

(i) For selenium, 18 mg/kg.

(j) For zinc, 1780 mg/kg.

III. Sludge quality certifications shall expire 2 years from the date of issuance.

IV. University of New Hampshire cooperative extension services best management practices with regard to agronomic application rates of sludge shall be adhered to by any person who land applies sludge.

Amend RSA 485-A:5-f as inserted by section 3 of the bill by replacing it with the following:

485-A:5-f Sludge Containing Dioxins. The following limitations shall apply to the land application of sludge containing dioxins, in addition to all other rules and laws applying to the land application of sewage sludge:

I. No pasturing of livestock and fowl whose products are consumed by humans shall occur on fields that receive sludge or residuals containing dioxins TEQ above 1 ppt.

II. The restrictions in this section on pasturing of livestock or fowl whose products are consumed by humans shall apply to subsequent purchasers of the land utilization site. It shall be the responsibility of the utilization site licensee, landowner, or any subsequent landowner to notify any purchaser of such land that sludge or residuals containing dioxins TEQ above 1 ppt have been applied to that site and that subsequent owners are subject to use restrictions under this regulation.

III. When filing an application for sludge and residuals utilization with the department, the applicant shall submit a copy of a statement signed by the landowner and, if different, the operator of the site, that specifically acknowledges the presence and concentrations of dioxins TEQ above 1 ppt in the material to be spread, and the ability and willingness of the landowner to comply with all rules and laws governing the land application of sludge containing dioxins TEQ above 1 ppt.

1999-0674s

AMENDED ANALYSIS

This bill establishes:

I. Notice requirements for persons who land apply sludge.

II. Record keeping requirements for haulers of sludge.

III. A prohibition on wastewater treatment plants from excluding towns that regulate sludge disposal within their borders.

IV. Limitations to land application of sludge including sludge containing dioxins.

V. Specific requirements and limitations for the land application of class A and class B sludge.

VI. Requirements for persons or facilities acquiring sludge quality certification requirements.

Environment
January 21, 2000
2000-3163s
08/01

Amendment to SB 218-FN-A-LOCAL

Amend the bill by replacing all after the enacting clause with the following:

1 Moratorium on Use of Certain Sludge to Reclaim Gravel Pits. Class A and class B sewage sludge and industrial paper mill sludge shall not be used to reclaim spent gravel pits above aquifers.

2 Duration of Moratorium. The moratorium in section one of this act shall expire July 1, 2001.

3 Effective Date. This act shall take effect upon its passage.

2000-3163s

AMENDED ANALYSIS

This bill places a moratorium on the use of class A and class B sewage sludge and industrial paper mill sludge to reclaim spent gravel pits above aquifers. This bill also provides that the moratorium shall expire July 1, 2001.

# Committee Minutes

Date: April 1, 1999
Time: 1:30PM
Room: LOB306-308

The Senate Committee on Environment held a hearing on the following:

SB218-FN-L regulating the land application of sewage sludge.

Members of Committee present:

Senator Russman
Senator Cohen
Senator Below
Senator D'Allesandro
Senator Johnson
Senator Krueger
Senator Pignatelli
Senator Wheeler

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The Chair, Senator Richard Russman, opened the hearing.

Senator Richard L. Russman, D. 19: Come to order please. We'll now open the hearing on Senate Bill 218, and I'll recognize the sponsor, Senator Katie Wheeler. Welcome Senator Wheeler, ... and I'm going to ask everybody to keep their remarks very brief because we have to cut it off at three o'clock and I'd like to get as many of you as I can so just please don't repeat over and over again, what everybody else has said because we don't need to hear that, so go ahead Senator Wheeler.

Senator Katherine W. Wheeler, D. 21: Thank you very much Mr. Chairman and members of the committee, I'm Senator Katie Wheeler from district twenty one. I'm here as the sponsor of Senate Bill 218 which is a sludge regulation bill. There is an amendment, there are copies of it up here, more being made if you haven't been able to get them. It amends section 2 of the bill and should address some of the concerns that have been raised because we realize the bill was not drafted as precisely as it should have been. Just a couple of words about sludge. This is the stuff that the federal government decided that we shouldn't put in our oceans anymore, but it seems to be okay

to put it on land so I think we have a duty to public health and safety to talk about exactly what we want to put on our land, and what kind of land we want to put it on. Do we want to put it on our agricultural land , our forest land, in our gravel pits, where do we want it , what is it and how should we be able to regulate it. The Harbor Collins Dictionary of Environmental Science defines sludge as; a viscous semi-solid mixture of bacteria and virus laden organic matter, toxic metals, synthetic organic chemicals and settled solids removed from domestic and industrial waste water at a sewage treatment plant. We probably wouldn't be here if we separated our industrial waste and our domestic septage, but we don't do that. In the amendment, we clarify that we are talking almost exclusively about class B sludge. You'll see that all the references in romans two, three, etc., until you get down to line twenty three, are about class B sludge, so that should put to rest some of the fears that we're going to not allow communities to use class A sludge. The only thing we say about class A sludge in here is that we don't want it stockpiled or land applied on hundred year floodplains or where there is less than four feet of unsaturated soil between the lowest point. You can read that for yourself, but, I want to point out that change. This bill is largely, I think, in reaction to the new rules from DES that we feel have reduced the standards, rather than improved the standards, and are putting our public health at risk . The new metal standards in this bill are affecting what I consider to be an unsound fiscal note, and we are constantly told that New Hampshire is producing very low metal content sludge, so in that case, meeting these new standards should not prove to be to burdensome. The original standards that DES proposed for the year two thousand , were going to be mandatory. There were objections from the industry so now the standards are voluntary . I don't think that works here. The new DES rules allow the UNH best management practices, or in certain cases, standards from industry which is putting the regulator in charge of the product. I consider that to be a problem. There are people here who will be able to talk to you in greater detail, I have written testimony which I will submit, I'm around so you can talk to me later and I would like the opportunity for those who have come from a long distance, to have a chance to testify.[See Attachment A]

Senator Richard L. Russman, D. 19: O.K., now, I need a sign up sheet. Otherwise I can't call anybody. Any other Representatives or Senators here that need to speak... O.k. the chair would recognize Paul Currier from DES.

Paul Currier: Thank you Senator, I'll leave a whole package of material over here, and I'll be brief to allow people to have comfortable ways to speak [Attachment A]. For the record, my name's Paul Currier I'm the administrator of the surface water quality bureau at DES, and we're the part of DES that administers the sludge program. I appreciate the opportunity to

speak and say the DES does not support this legislation and I would encourage that the committee would find it inexpedient to legislate. Haven't had the opportunity to look over the amendment in any detail, I don't think that changes the substance of my testimony. Essentially, Senate Bill 218 seeks to incorporate into law permitting requirements and technical standards which had been fully considered in the rules that we recently adopted and in some cases to change those standards. I want to point out, that we went through a very significant public outreach process in coming to our new rules, and if you look in the folder there, there is a record, a summary record of that which I urge you, if you were going to look over, provides a summary of the testimony we received in the outreach and so on. We incorporated that into substantive new rules, and believe that we have reached , although not a final aspect as far as regulation of sludge, a significant interim step which includes regulation of sludge in New Hampshire, and addresses many of the issues that were outstanding when we began the rulemaking. We are committed to a further round of rule making because there are several issues which came about as a result of our consideration of public testimony, which are not fully flushed out in the existing rules although the existing rules are protected. We have concerns, serious technical concerns with this bill which are summarized in the table and I won't go over them . For example, lack of specificity in describing dioxin and standards, a large one is the thirty day holding time limit which I think still remains in the amendment, which essentially makes land application infeasible whether you talk about class A or class B, because of the requirements for handling material . We do not support the prohibition on municipal waste water treatment plants being required to take septage from all towns, that might force them into a position of not operating their treatment plant effectively for the purpose for which it was designed , and it's also in conflict with existing state statute and another example is the proposed two hundred fifty foot set back which our analysis showed would have no perceptible benefit on the water quality . In summary, the rules are still a work in progress we are committed to another round of rulemaking and to further public outreach and further consideration of all persons that want to assist us in developing, further development of the rules. The present standards in the rules are risk based and are based on an analysis of risk, and we have continued work to do there but the standards at this time, of the existing rules are protected , and in summary, we believe that the net effect of the provisions of Senate Bill218 would be essentially a ban on the land application of sludge. Be glad to answer any questions .

Senator Richard L. Russman, D. 19: Questions for Paul? I have one. Could you at some point review the amendment a little closer and send us a letter, comments on the amendment.. and also, would you comment just briefly if you can, I noticed in the rules when they first were proposed that you didn't

think it was a good idea to use it for reclamation of gravel pits and that dropped out why did that happen?

Paul Currier: We essentially, analyzed in detail, the risks to groundwater that might occur due to sludge land application , and our analysis showed that the risk from leaching of chemicals given our current standards, and I would add, the regulations now provide for specific limits for organic chemicals to prevent leaching. That was not in previous rules. We determined that the primary risk was one of pathogen transport to ground water and specifically viruses 'cause the larger pathogens have filtered out through the course of material. What we did to address that was the new rules prohibit the land application for reclamation of sludge which contains viruses. That is, you have to meet the class A standard for viruses for any material that is used on a reclamation site, and our determination was that that resolved the issue of leaching and it was, we were sufficiently protected to use this material on reclamation sites.

Senator Richard L. Russman, D. 19: O.k., thanks very much. Any other questions? Thank you very much. I would recognize David Bernier. He's down here from Gorham, I guess, so why don't you...

David Bernier: Ladies and gentleman, thank you and good afternoon. I'm from way up on the northern side of the notch in the town of Gorham. I'm the superintendent of the Gorham water and sewer department, and I have been for the last fifteen years. Let me state off by stating that we do not currently land apply biosolids, or sludge, or whatever you want to refer to it as, nor have we ever. However, in 1989 our sewage treatment plant won the EPA region one award for operations and maintenance excellence. The next subsequent year, in 1990, we went for competition at the national level. Among sixteen thousand sewerage treatment plants in the nation, the town of Gorham came in second place. The only thing that prevented us from gaining first place in the nation, was because we did not exercise beneficial reuse of our biosolids, so we took a hit for that, and what we've been doing for the past fifteen years is land applying our biosolids, not land applying, let me rephrase that, land filling our biosolids, and we currently continue that practice, however, in this year of January of 1999, our tipping fees at the Mt. Cadbury landfill, which is owned and operated by the Crown managed pulp and paper mill, increased by a hundred percent. Right now, the town of Gorham, and our sister city, the city of Berlin, is looking into the option of being able to land apply our biosolids from our sewerage treatment plant. Right now, we are meeting class A biosolids requirements which is the best stuff available, and if you were to come up and take a look at the material

that we produce, I would feel more than comfortable in taking a whole quantity of it and stuffing it into a mattress and sleeping on it, because it is just beautiful material. We have people coming over and looking at it all the time. In this proposed bill ... One of the biggest requirements, in order to meet class A biosolids, you must meet a PH limit of 11.5 within twenty four hours after the sludge has been produced. That meets the requirements for pathagen and vector reduction as part of 503 in the EPA regulations. The other thing that happens is, traditionally, the ground water and the surface waters of our state are void of buffering capabilities. What happens is the water is very acidic, and it leaches lead and copper which are heavy metals from the household plumbing. We, as a water purveyor, because I wear both hats, have to address those concerns, and we have to add lime or baking soda or some kind of buffering capability, to bring that water from an acidic state to an alkaline state, in order to prevent lead and copper from leaching in the household plumbing, because, we need to provide safe drinking water at the tap. Well, John Q. Farmer who may land apply his biosolids at a higher limit than 6.5 to 7 which is currently in there is doing himself a favor as well as all the other inhabitants of the state, because, a higher PH limit would also address those concerns, because, if they're trying to stipulate 6.5 to 7 on the PH scale, a higher limit on the PH by adding lime and lime stabilizing that, if it does leach into the ground water or the surface waters of the state, it is doing us a favor, because it is neutralizing and adding buffering capabilities to our drinking water supplies. Just in common sense, what's happened is that toxicology hasn't kept up with technology, and because we can measure ethylmethyl bad stuff to the enth degree, we currently do not know what is safe and what is unsafe, and I think the existing 503 regulations do a very fine job of addressing what's safe and what's unsafe.

Senator Richard L. Russman, D. 19: Questions? Thank you very much for your testimony. Chair would recognize Jim Bailey from Warner Village water.

Jim Bailey: This is my first time so I don't know how to address the panel but ... Good afternoon [Written Testimony Attachment D].

Senator Richard L. Russman, D. 19: O.K. , Questions? Now we are going to be going back in session at three o'clock, so we have about twenty minutes or so left. What I'm going to obviously have to do is probably recess this hearing and it'll be rescheduled on the calendar, but we'll go a few more people, and again, I'm going to urge you to keep it to a couple of minutes of what you've got to say it'll save you coming back and soon and so forth, and o.k. Jim Dodge. If you can keep it as brief as you can that would be helpful.

Jim Dodge: I'm on the farm that has been in my family for generations. Probably we'll all agree that a good looking farm is a tourist attraction, and if you don't believe it, come up to my farm and see the many fine vacationers that come in to see ya.. Now my father before me taught me that the sign of a good farmer is the condition of his fields, and you cannot have them in good condition unless you have the necessary fertilizer. Nitrogen is one of them. Right now it is economically impossible for me to fertilize my fields with the nitrogen you'd buy say at the Agway. When I called to buy it, the guy said " look nobody's buying it, the price is too high." That was the man who was selling it. I have read this. I would be amazed to find the farm in New Hampshire that would be qualified under these rules. For instance, it's got to be "the bottom of the sludge must be three feet above seasonal high water table, " anybody who has a septic system in those conditions is really favored. That's very unusual. Seasonal high water table is much higher. "You can only have eight percent slope." I suppose I could cheat 'cause I doubt anybody's gonna come up and do a profile of that land, but I'm not going to cheat because very little of my land is less than eight percent . In that place I know my barn was built in 1770 it's been farmed ever since, and now if we cannot get fertilizer, we can no longer farm, and I think the farms that are left, should stay . The farms that my ancestors owned, are now part of the urban sprawl. The golf course in Pembroke is one of them, an amenity that attracts people to come to Pembroke, and has made it a bedroom town. I think it's very essential to preserve the farm and this will put them out of business.

Senator Richard L. Russman, D. 19: O.k., thanks. Questions for Jim Dodge? No. Thank you very much. The Chair would recognize Kurt Blomquist .

Kurt Blomquist: My name is Kurt Blomquist, I'm the public works director for the city of Keene. I'd like to say again Keene has been very involved with the development of the sludge management rules that we have in place today 'cause we take a great interest in them. I think one of the things you have to note that myself and my compatriots are here. We are a part of that public health consideration, none of us are in a profession that we're there to threaten. Our job is to protect public health and due practices that are both environmentally sound, but also reasonable for the rate payers. Many of the comments that you'll hear today will go in again about where this [...] bill will ban land application of both class A and class B sledges. That will basically require that all material now be landfilled or incinerated. As you heard, briefly about the fiscal impacts of one community, there would also be fiscal impacts to Keene. As we know tipping fees in New Hampshire are going up, some in cases in triple figures. Right now, I spend approximately two hundred thousand dollars a year on

sludge disposal. My estimates right now will be close to two hundred thousand, again, that will be passed on to the rate payers. I think that's what we ultimately have to remember here is no matter what we do it will be paid for, it will be paid for by the rate payers. We're also concerned about directing a community to accept material. All plants are funded locally, the community decided they were going to build a plant or a treatment system and fund it locally . They are designed specifically to meet that need . If we have excess capacity, sure, it's there for the other communities to use but we should not be directed. Again, a lot of the other comments have touched on many of mine, I'm going to just say this bill again will ban the use of sludge as land application in the State as it's stated today.

Senator Richard L. Russman, D. 19: O.k., thank you very much. Questions? Thank you very much for your taking the time to come here. Mike Townsend, Lebanon.

Mike Townsend: My name is Mike Townsend. I'm a fourth generation dairy farmer from up in Lebanon and we use biosolids and I'm opposed to Bill 218. We've been using biosolids now for eight years. We've been also working with UNH on test plots for the last eight years with different application rates. We've been following the best management practices both in the voluntary and now it's required . The two hundred and fifty foot setback would just eliminate most all of the fields that we're currently using it in. Due to a couple of small streams that run along it . Economic impact to our farm, I can't say it'd put us out of business but it would definitely make us rethink our strategies and what we're doing at this point.

Senator Richard L. Russman, D. 19: Senator Below.

Senator Clesson J. Blaisdell, D. 10: What's your source for the biosolids?

Mike Townsend: It was coming from Hanover and now it is coming from Concord, Suncook, and [Brattleboro]

Senator Richard L. Russman, D. 19: Do you pay for it?

Mike Townsend: No.

Senator Richard L. Russman, D. 19: Do they pay you to take it?

Mike Townsend: No. They deliver it free of charge.

Senator Richard L. Russman, D. 19: O.K., any other questions? Thanks very much for talking the time to come down. Charles Hanson from Center Harbor.

Charles Hanson: Thank you. Mr. Chairman, I also am part owner of a recycling company, White Mountain Resource Management , we work with, we do land application, have for a number of years, worked with over 200 farmers here in New Hampshire, and I'm here today to express the sentiments as expressed by Mike Townsend earlier, of many of the farmers who have been calling me this week with regards to this bill, because they see this as a serious threat, certainly to their rights, and I have a letter from one of them , Eric Sawtelle from Pinewood Yankee Farm down in Durham New Hampshire and I wanted to read that for the record..[Attachment E].

Senator Richard L. Russman, D. 19: Thanks very much, questions? Thank you very much .... Tape end of side one....

John Hudson: I'm John Hudson, a farmer in Meredith , also a proponent of using sound science in regulatory decisions. I grow vegetables, and with the perception of sludge, I don't use it. Also, with a small farm such as mine and the problems with rotation that would be incurred by the existing federal regulations, that effectively rules it out as well. However, I am concerned about other farmers, including the remaining a hundred and ninety four dairy farmers in this state. There was a couple thousand when I was in school , and with a variety of reasons, some not related to this it's pretty much a marginal enterprise, and if we're not careful, the dairy industry will go west, just like our poultry industry in the state has gone south and is practically defunct by now. I'd like to bring your attention to this... "For our Future, a guide for caring for New Hampshire's Environment." Part of the output of the New Hampshire comparative risk project , I assume that commissioner Varney sent each one of you these also. You will note in that, that as far as ranking, environmental and public health threats, sludge is way down there at forty eight, well below other big threats like carbon monoxide in our outside air. I think you should take that into consideration. This bill has been forecasted to cost the people of New Hampshire well over a million dollars a year, and I would maintain the benefit they would receive from that is essentially, nill. That million dollars, I would suggest, would be very well applied to some real problems that we have like some of these combined storm water sewerage overflow problems, that have significant harmful effect on our water supply and water quality. Biosolids that meet the federal 503 regulations are safe, EPA has not gone soft and gotten away from worse case overkill , you can be assured that ones that meet their requirements and are applied according

to their requirements are safe. The State requirements don't make them any safer, but they maybe make them a little more palatable to abutters and such with notification and some odor problems. We should remember that biosolids are a natural product and they are very important for supplying nutrients to crops and as well, increasing the organic matter which improves the soil structure of the water holding capacity and nutrient holding capacity, biological activity in the soil , and general soil quality. These are some, some of these effects you don't get from commercial fertilizers that would have to be used if these were not available.

Senator Richard L. Russman, D. 19: O.k., thanks is there any other points you need to make, I'm trying to get a couple more people in here before we go. Some other important point, make it and then I gotta get on...

John Hudson: Is there any question?

Senator Richard L. Russman, D. 19: Any questions... o.k... thank you very much. The Chair would recognize Sue Roberts from Belmont.

Sue Roberts: I didn't ask to speak and I endorse everything they've said.

Senator Richard L. Russman, D. 19: O.K., that's fine I just want to make sure I give you that opportunity ma'am. This gentleman right here, why don't you come up ... Did you wish to speak. Thank you very much.

Bruce Kudrick: Yes, my name is Bruce Kudrick, I'm the superintendent of the Hooksett waste water department. We have been class B sludge for the last sixteen years. Land applying. We land apply with the farmers, gravel pits, we could use topsoil, save the taxpayers hundreds of thousands of dollars in making ball fields with the topsoil, and we also are now in the process of closing a landfill. What I see in reading this bill, is for our business, and, make myself short, I have a question back to you. What do you want us to do with it? Can't compost it . Can't land apply it. Can't go to the landfill , that's closed in five years, over in turnkey, what do you want us to do with it? I produce, I don't produce it, the treatment plant produces twelve thousand gallons of sludge a day. It has to go somewhere. Working with the DES, we've been working with them since 1995, on the technical review committee, and to me, we're going backwards., but, unless you have an idea, what do you want us to do with it? That's what all the operators ask me, and I don't have the answers. Do you have an answer for us?

Senator Richard L. Russman, D. 19: Not yet. O.k., all right, thank you very much for your testimony, questions? Thank you very much. Dan Harvey. Did you wish to speak?

Dan Harvey: I don't want to speak, but I agree with most everything that's been said, but the problem of individual towns making a law against it bothers us.

Senator Richard L. Russman, D. 19: O.k., all right, thank you very much , The Chair would recognize Lou Hanson from the town of Center Harbor go ahead...

Lou Hanson: I just very adamantly support the use of biosolids for land spreading. As far as my own history's concerned I'll say that my family's been part of this state since before 1700, right up till the time that I did and I left home during world war two and became a part of the air force heading up all of India and China and I was still interested enough in farming to see the practices where they used this material . It has been used for centuries all over the world. In later years, I spent seventeen years in special divisions in Washington where I got to fly practically every country in the world , as the geographic lines were drawn at that time, and it's a practice that's been carried on for a long time. We personally, we have over a hundred acres right now of tillage, we've been using biosolids since 1990 and we didn't go into it blindly, we studied everything that we could. There wasn't a lot available here in this State, but we checked all the agricultural publications, and other things that came from other states where it was in use, and we determined that it was safe. Biosolids that have gone on our land has produced fantastic fruit. I was born and raised, my father had died when I was sixteen, but in any event, he used to preach all the time about keeping open land, and it was a struggle even back then. This was sixty years ago, now, and seeing the transformation of this whole state since then, the state is mostly forest there just isn't that much open land, and the to keep the land healthy and so forth, you have to put back when you take something away, and certainly used to be in the old days, like in our immediate area of Merideth and Sun Harbor, and Moultonlborogh, there were seven dairy farms there when I left home in 1942, there are none there now, and the fields that we used to hay, we used to hay a lot of Moultonborough neck, Long Island. Long Island where we used to hay it's condominiums and summer homes, which is fine, but I still think that any State should maintain some open space, that is available for agricultural use, and like I said, in our case, we have part of our acreage is in another town, and the other town passed some local regulations that

made it so difficult that actually it would be impractical to unify ourselves so we used fertilizer in order to keep our program going, and so forth, and in using the fertilizer, we had the feeling, we know what's in the biosolids, Our biosolids have been tested for metal, they've been tested for pathogens and so forth, and then the soil is tested yearly, and we know what's in it, but to replace it with fertilizer. They haven't had all these requirements on fertilizer. We're not sure what went in the soil with the fertilizer, and it makes a terrific difference in the out, and as far as the DES handling this I'm in my thirtieth year as a selectman in Center Harbor now, and I've been through a lot with state agencies, especially in solid waste, the sister town of Meriden , and I was the Center Harbor representative, I worked with the different outfits which are all under one head now, and I have a lot of confidence in our state agencies and I certainly have all the confidence in the world in our DES and I feel that this should not become political, we should let them do the job, let the experts do it and go from there. Speaking of that, we have the other state agencies I've worked for too, but just a quick note, I remember with ERA, we worked with them, of course over the thirty years. I remember when Mel Thompson, well, I don't remember, but ....

Senator Richard L. Russman, D. 19: I've got to cut you off only because we're running late, almost three o'clock, we've got to get over there for session. I can not, unfortunately have any body else, obviously we're out of time, we will recess the hearing until another day. It will be in the calendar if you want to come back and testify. I don't know when it will be. You can put testimony in writing anytime. ....

HEARING RECESSED 3:00PM

**TO:** Members of the Senate
**FROM:** Megan Konys, Legislative Aide
**DATE:** April 14, 1999
**RE:** **Hearing report on SB218-FN-LOCAL,** regulating the land application of sewage sludge. **(Senate Environment Committee, 4/1/99)**

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**Sponsors:** Sen. Wheeler, Dist 21; Sen. D'Allesandro, Dist 20: Sen. Disnard, Dist 8; Sen. Russman, Dist 19; Sen. Cohen, Dist 24; Rep. B. Hall, Hills 20; Rep. Owen, Merr 6

**What the bill does:** This bill establishes:

I. Notice requirements for person who land apply sludge.

II. Record keeping for haulers of sludge.

III. A prohibition on wastewater treatment plants from excluding town that regulate sludge disposal within their borders.

IV. Limitations to land application of sludge including sludge containing dioxins.

V. Requirements for person or facilities acquiring sludge quality certification requirements.

**Who supports the bill:** sponsors; Chris Rueggeberg, Sierra Club; Caroline Snyder, Citizens for a Future NH; Doug Bogen, Clean Water Action

**Who opposes the bill:** Paul Courier, DES; David Bernier, Superintendent of Gorham Water & Sewer; Superintendent of the Waterville Water District; Bruce Kudrick, Town of Hooksett, WWTP; Doug Steele, Dover WWTP & NHWPCA; Alwynne Hellfach, Piscataqua Environmental Services, NHWPCA; Sue Roberts, Farmer; Charles Houson, Farmer; Jim Dodge, Farmer; Core Blundquest; Mike Townsend, Dairy Farmer; Shelagh Connelly, White Mountain Resource Management; Brenda Clemons, NH Farm Bureau; John Hodson

**Testimony report:** The prime sponsor testified that this bill has been introduced as a response to the new sludge rules adopted this month by DES. The purpose of SB218 is to legislatively provide the management, testing, sludge quality standards, and land application standards that will protect NH's agricultural resources, water resources, wildlife, and the health of its citizens. As amended, SB218 focuses on the regulation of Class B sewage sludge, which is lower in quality than Class A. The prime sponsor testified that the new DES sludge rules ignore many of these environmental concerns.

The Department of Environmental Services testified in opposition to this bill. Among the Department's concerns regarding SB218, is the bill's lack of specificity, 30 day holding time, and proposed 250-foot setback. Several farmers testified that this bill is a serious threat to their industry, as sludge is commonly used as fertilizer. Farmers believe that the economic impact of this legislation could hurt the remaining NH farms.

**Funding:** The Department of Environmental Services stated this bill will decrease state restricted revenue by $11,000 in FY 2000 and each year thereafter. Local expenditures will increase by $1,160,800 in FY 2000, by $1,219,400 in FY 2001, by $1,280,900 in FY 2002 and by $1,345,500 in FY 2003. There will be no fiscal impact on county and local revenue or state and county expenditures.

**Future Action:** Pending

Date: May 6 1999
Time: 1:15PM
Room: LOB201-203

The Senate Committee on Environment held a hearing on the following:

~~HB340~~ SB218-FN-L establishing a committee to study mercury source ~~reduction and recycling issues~~.

Members of Committee present:

Senator Russman
Senator Cohen
Senator Below
Senator Johnson
Senator Krueger
Senator Wheeler

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The Chair, Senator Richard Russman, opened the hearing.

Senator Richard L. Russman, D. 19: I'd like to open the hearing on218-FN. We started this hearing sometime ago. It's a continuation. There is an amendment that Senator Wheeler has proposed. She is going to introduce that or reintroduce that shortly, and certainly we'll go from there and if you've already.... O.k. go ahead Senator.

Senator Katherine W. Wheeler, D. 21: Thank you very much Chairman Russman, and members of the committee for letting me reintroduce the amendment to Senate Bill 218. It is the amendment numbered 0674S and dated March 31, 1999, which is replacing the section two of the bill. I just want to refresh your memories about what this... I'd like to go through it with you if you don't mind too much. I'll try to make it pretty quick. Section one in the original bill as introduced is just the notice of septage or sludge spreading. The amendment does not affect that. It's just where it gets recorded and what needs to be recorded and you can read through that on your own. The section two, which is the amendment, is talking about how the land application of sludge is regulated, and in roman numeral one, we say that if they're going to be land applied in New Hampshire, the rules or

regulations of the State of New Hampshire or the state in which the sludge was generated, whichever are more stringent will be adopted. This was passed in 1998 it's not new, but it's restated in Roman numeral one. Roman numeral two clarifies that we are talking about class B sludge. If it's for grazing animals or where forest crops are being grown it should be turned over into the soil immediately, so that it can't run off or be eaten by grazing animals or blown into homes containing the pathogens which it might have, so we are saying that if its on... if that's where it is it needs to be turned over and not just left on top of the soil. Roman numeral three, is prohibiting it, class B sludge from being applied to forest land or newly clear-cut areas so that it would eliminate class B sludges use in forest because it has no nutrient value for forests and it, indeed, adds stress to forests. Class B sewage sludge, Roman four, and industrial paper mill sludge, shall not be used to reclaim spent gravel pits above aquifers. What we have been doing in New Hampshire with gravel pit reclamation violates the federal regulations regarding nitrates leaching. We need to be very careful about what we do with our aquifers. Roman numeral five, the pH reading of between 6.5 and 7 shall be maintained. That's saying that you can't just put the sludge there and forget about it because there is a symbiotic relationship that happens and once a fill has been treated the metal.... gap in tape...so it expands the rivers management protection program to surface waters in general which we feel that one of our goals to protect New Hampshire's water quality. Roman numeral seven is the minimum distance of three feet between seasonable high water table and the lowest point of the land application of sludge. We obviously don't want the water table to reach the sludge. That would not be environmentally good or good for our health. Roman numeral eight, now here we talk about class A and class B sludge shall not be stockpiled on land or applied on hundred year floodplains. The floodplains are defined by the U.S. geological survey. Stockpiles may be placed on sites that are not floodplains up to and including thirty days before any planting or seeding. Sludge shall not be stockpiled where there is less than four feet of unsaturated soil. You can read that. This is, again, a protection measure. Roman numeral nine, class b sludge shall not be applied to agricultural land which ha s a slope greater than eight percent. Because of runoff we have this. The town of Bristol ordinance prohibits sewage sludge because the town is so hilly. They didn't want to have to deal with the runoff problems that's why this is there. Deliveries of class A sludge exceeding twenty tons per sight per year should be reported to the department that just makes sense. The next page of the amendment is the list of the metal concentrations. Changing the maximum metal concentrations. If you look at Roman numeral three, it says sludge quality certification shall expire two years from the date of issuance. Those are in the current rules, but the DES new rules are for five years and we think that's too long and that two years is appropriate. That's what we had and we think it should stay that way. Roman numeral four, adhering to the

New Hampshire Cooperative Extension Services best management practices. That's what we've always had, but the new DES rules allow UNH best management practices, or in certain cases, the standards from industry which I believe puts the regulator in charge of the product, and so that's why this is in here to remind us that those best management practices should be adhered to. Then on line twenty-seven, dioxin. We need to talk about dioxins in our law, and this is a response to the DES criticism of our bill. The dioxin language was too vague. This is putting, I think, a more specific language in. Mainly, our goal is to keep dioxin out of the food chain. It is one of the most dangerous substances. Our tolerance is reduced the more we ingest. It can be in air, it can be in water, it can come everywhere. Dioxin is very dangerous, and we want to reduce it so that we're not having our children, our elderly and the rest of us, subjected to it. So, you can read all that about dioxin. The compliance shouldn't be too burdensome with this because we're always being told that New Hampshire is producing low metal content sludge. If that's true, then we shouldn't have any trouble with complying with this bill. These new metal standards are affecting what I believe is an artificially high fiscal note, however, these are the standards that DES originally proposed for the year 2001. When industry objected the standards became voluntary. I don't think we should have voluntary standards in something that's this important. As I've said, we have a UNH professor who's always argued that New Hampshire produces sludge that's low in metals and if this is true, the industries will have no trouble meeting the new maximum metal concentrations and the sludge will not have to be landfilled. Senate Bill 218 does not require landfilling as the only option for sludge disposal, it just regulates sludge used for agricultural applications because we want to keep it out of the food chain. People who like to eat it sometimes demonstrate how safe it is, but I honestly don't believe that we want to give it to our children day after day. UNH cooperative extension recommends that in order of priority sewage sludge first be applied to non-agricultural land. It can be used for capping landfills, roadside restoration and athletic field renovation landscape sights, etc. This is not a total ban on sludge; it's just saying let's keep it out of our food chain. Thank you very much for your indulgence on letting m present this amendment again and I won't take questions because there's going to be a ton of people...

Senator Richard L. Russman, D. 19: Anybody have any questions? I have one relative to the reason for B not being applied to forestland.

Senator Katherine W. Wheeler, D. 21: It's my understanding that it really isn't helpful for forests, but I trust they'll be some plant biologists or somebody who could expand upon that for you.

Senator Richard L. Russman, D. 19: All right. Go ahead Senator Below.

Senator Clifton Below, D. 5: Thank you, Mr. Chairman. Senator Wheeler, on page one of your amendment, lines twenty three through twenty seven referred to class A and class B sludge which I think are all kinds of sludge... correct.. not being stockpiled, one hundred-year floodplains. I don't know if this is true or not but it occurs to me that most sewage treatment plants are often in or very close to just above the hundred year flood plane and so as sewage treatment plants compost their sludge then they in fact, stockpile it next to the sewage treatment plant which may be in the hundred year floodplains. Is it your intent that where it's being generated. Does this apply as well if it's next to a sewage treatment plant?

Senator Katherine W. Wheeler, D. 21: If it's a hundred year floodplane or there's less than the four feet of unsaturated soil, as stated in there, yes I think it's....that is my intent. I would be open to considering an exemption but I haven't proposed one at this time.

Senator Richard L. Russman, D. 19: Questions? It sounds like the... on the land applied on hundred year floodplain that ... how much, percentage wise, you know how much land that would affect.

Senator Katherine W. Wheeler, D. 21: No, I don't.

Senator Richard L. Russman, D. 19: Further questions from the committee? Thank you very much for your testimony. Chair would recognize senator Disnard.

Senator George F. Disnard, D. 8: Thank you Mr. Chairman. Members of the committee, for the record, I'm Senator George Disnard [See written testimony Attachment O].

Senator Richard L. Russman, D. 19: Thank you very much. Questions for the Senator? Thank you very much for your time, for coming here. Chair would recognize...

Representative Derek Owen: Thank you Mr. Chairman. For the record, Representative Derek Owen Merrimack County, District 6, and I'm obviously in support of the bill, also in support of Senator Wheeler's amendment. I'm going to speak only to one part of the bill in particular to keep my testimony short, and it has to do with dioxin. I don't know how many people here are familiar with Love Canal. Most people with any environmental thoughts would remember Love Canal and Lois Gibbs. I have relied on them for considerable information, and just for one segment of it, I'll read you off a couple of overall health effects associated with dioxin and dioxin-like chemicals. For one you have a cancer soft or connected tissue, lung, liver stomach non-hodgkin's lymphoma, metabolic hormonal changes including altered glucose tolerance and decreased insulin levels leading to increased risk of diabetes. I don't want to bore or excite the committee to much with the volume of information I have and I will submit it for testimony if I may. [Attachment D].

Senator Richard L. Russman, D. 19: Questions? Senator Below.

Senator Clifton Below, D. 5: Thank you. Representative Owen, the standards you were citing for dioxins seem to be lower than what's suggested in the amendment.

Representative Owen: Yes, they are.

Senator Clifton Below, D. 5: Do you know what references dioxins TEQ or one ppt... What's the TEQ stand for?

Representative Owen: The total dioxin equivalence and I believe that there is a professional in the background who can probably bring you up to the scientists point of view better than I. Professor Snyder will be testifying.

Senator Clifton Below, D. 5: So you're advocating that it go at least this far perhaps, further.

Representative Owen: Absolutely.

Senator Richard L. Russman, D. 19: Thanks very much for your testimony. Chair would recognize Paul Currier from DES speaking against the bill.

Paul Currier: Thank you Mr. Chairman. I have a letter of testimony and some attachments [see attachment Q].

Senator Richard L. Russman, D. 19: Questions? Senator Below.

Senator Clifton Below, D. 5: Thank you. The proposed sludge management advisory committee is that appropriate for legislative action or is this something that would constitute departmental initiative.

Paul Currier: We had proposed it to be a department initiative.

Senator Richard L. Russman, D. 19: Senator Wheeler.

Senator Katherine W. Wheeler, D. 21: Thank you. Thank you Senator Russman. Do you have the names of the people that are going to be on that committee yet or are you not...

Paul Currier: No, we are in the process of sending out letters. We have a proposed membership, which includes constituency very sufficiently. We're open to suggestion on that. We have not and our proposal is that the membership will be by invitation to the various constituencies, but we're open to suggestions.

Senator Katherine W. Wheeler, D. 21: Pardon me, is that in the material you've given us, that proposal?

Paul Currier: Yes, it is. It's the next to the last one, or the last one, exuse me, attachment four.

Senator Katherine W. Wheeler, D. 21: Oh, thank you.

Senator Richard L. Russman, D. 19: Senator Below.

Senator Clifton Below, D. 5: Thank you. Mr. Currier, is there anything in the bill that you feel the department would feel merits legislative action at this point or are you saying that you feel the entire bill is unnecessary.

Paul Currier: Right, we think the bill is unnecessary and in fact preempts our mission.

Senator Richard L. Russman, D. 19: O.k., further discussion? Thanks for your testimony, and I will tell ya up front, I do not expect to be calling on people that have testified back at our April first hearing if they've already had one bite at the apple in terms of their testimony so if you have testified previously, I cant guarantee that you're going to be called on today. O.k., the chair would recognize Paul Adams from Chichester, I believe it is.

Paul Adams: Yes sir, my name is Paul Adams and I've been asked to testify by one of the legislators. I represent a group called Technical Assistance for Pollution Prevention Incorporated, and we provide pollution prevention assistance to anyone in New Hampshire on a non-regulatory, non-profit, free, confidential basis. This group is an outgrowth of the New Hampshire Pollution Prevention Program which was established in 1991 and the five sponsoring members of this group four original members from 1991 and the fifth person is a Professor at Dartmouth College. I neither advocate or oppose the use of sludge, but there is a way to get the heavy metals, dioxins, and other chemicals out of the sludge, and I think the whole sludge debate had ignored this issue. Where do these metals and chemicals come from? This is the database of hazardous waste generators in New Hampshire, 11,000. of them. They are known. They are not all active. Those who are active have to submit hazardous waste manifests when they take hazardous waste off sight, out of state, wherever. They tell us what kind of waste it is. There is no reason why you cant go to these industries generating this waste and assist them in reducing the heavy metals. Over the past seven years, I have visited thirty four industries, numerous sewerage treatment plants, hospitals and other industries, and I find that industries are all willing to reduce the waste they put down the sewer if they're given assistance.....

END OF TAPE ONE SIDE ONE

...they wash the floors and it goes down the sewer, and we can't forget what shows up in the septage. People have a tendency to just get rid of their noxious waste down in the toilet. Household hazardous waste days eliminate some of this. I think the DES should come up with some sort of a no toxics to toilets program to eliminate this amongst other things. We find, in New Hampshire that to discharge water to a lake, river or stream, you have to have what is known as a MPDES, a pollutant discharge elimination system. Forty-six of the ninety-six POW's the privately owned treatment works, the state-controlled works in New Hampshire have lapsed permits. What does that mean? Well, EPA will tell you, even though they're lapsed they're still in effect because we're monitoring them. Well what it means is the public hasn't had a chance to look at the heavy metals limits put on industry by these permits. New Hampshire does not issue these permits. EPA region one in Boston does because New Hampshire has declined to take this authority. TAP is looking at a project in conjunction with Vermont to address the upper Connecticut River watershed. In that particular watershed, Twenty-four out of thirty six MPDES's are non-valid. As you may know, discharges to the Connecticut River through Vermont are controlled by New Hampshire. Back in July of last year when the sludge manager had a public hearing this little handout was given and it showed that even with the new limits, under eight hundred, five out of ten metals missed the limit standard. That's pretty exceptional quality. The limit standards for other sludge were missed by nine out of ten facilities. DES made some good proposals at that hearing, amongst them they're going to give assistance to land applying POTW"s. That's where you start. The guy's landapplying. To help them reduce their contaminate loadings. They're going to come up with a program they propose for twenty percent state grants and low interest loans, then their proposed going to the legislature for get some grant assistance. There are other ways to solve this problem. The community Development Block Grant Program, for example, Colebrook just received a seven hundred thousand dollar grant because "a lapsed MPDES"... might have been a discharge permit. Perhaps they can come up with an emissions trading program like the air trading . If you get one industry that produces heavy metals consistently below those allowable, he can trade off the difference to some industry who can't reduce his metals because of some particular process. EPA just issued the nineteen ninety nine state of the New England Environment bulletin and I would like to point out to you that in there, under the toxic release inventory , once every year, those emitting toxins beyond certain limits have to report to EPA. In 1997, New Hampshire was the only state to have an increase in toxic release to the atmosphere. That basically summarized what I wanted to say. I think there is a way to get the metals out, and hopefully soften the sludge debate. It takes money, it takes attention, it takes time, and that's why I formed this group. To give them that attention and time. Thank you.

Senator Richard L. Russman, D. 19: Questions for Mr. Adams? Thanks very much for your testimony. The Chair would recognize Alex Duran from BFI organics.

Alex Duran: Thank you Mr. Chairman, members of the committee. For the record, my name is Alex Duran, I'm an environmental engineer with BFI organics . One of the firms managing organic residuals in New Hampshire and adjacent New England States. Thanks for the opportunity to provide this testimony. [Attachment R]

Senator Richard L. Russman, D. 19: Thank you. Questions? Thanks very much for your testimony. The chair would recognise Katherine Rhoda from Bethlehem.

Katherine Rhoda: Thank you. My names Katherine Rhoda, I'm a citizen of Bethlehem, New Hampshire. [Attachment S].

Senator Richard L. Russman, D. 19: Thank you, Questions? Thanks very much for your testimony, Chair would recognize Judith Silva from the New Hampshire Municipal Association.

Judith Silva: Good afternoon, Mr. Chairman, members of the committee. My name is Judy Silva I'm from the New Hampshire Municipal Association and I appear here this afternoon in opposition to this bill.[Attachment T,U]

END OF TAPE 1 SIDETWO

Senator Richard L. Russman, D. 19: Thanks. Questions? Thanks very much for your testimony. The Chair would recognize Shirley Grilli.

Shirley Grilli: My name is Shirley Grilli, and I'm from the town of Haverhill. I appreciate being able to talk to you today. Basically, I just wanted to talk you as a resident of the North Country. Haverhill is a dairy area and we have a lot of large dairy farms. It's also a very beautiful area

and we have a lot of lakes and streams. I'm urging you to vote in Favor of Senate Bill 218. [Attachment V].

Senator Richard L. Russman, D. 19: Questions? Thanks very much. Chair would recognize Brenda Clemmons.

Brenda Clemmons: Thank you Mr. Chairman, members of the committee. I'm the Public Affairs Director for the New Hampshire Farm Bureau. Thanks for the opportunity to express our concerns regarding senate Bill 218. [Attachment W]

Senator Richard L. Russman, D. 19: Thanks very much. Questions from the committee? I have a question for you . Prospectus wise, how many acres of land do you represent ?

Brenda Clemmons: I don't have that particulars.

Senator Richard L. Russman, D. 19: Percentage wise how much sludge is being spread over.

Brenda Clemmons: I believe twelve. Landbased I don't have that answer but there's about two hundred farms that actually utilize biosolids in the state. But I don't have the percentage and perhaps DES would, could provide that.

Senator Richard L. Russman, D. 19: Alright, Senator Cohen.

Senator Burton J. Cohen, D. 24: Thank you. I understand the challenges facing the agricultural community ...You mention that as compared to fertilizers, sludge is provided virtually no cost. What about the cost of cleaning up the water? How is that to be paid?

Brenda Clemmons: Farmers are... use all of the products whether it's commercial fertilizers or biosolids or on sight resources very wisely. They're very, very careful to protect the water resources. They use them, they drink

them. They're very concerned about that. They do not, they will not, intentionally hurt the water resources . Further Questions ? Thanks very much Brenda for your testimony. Chair would recognize Tom Irwin.

Tom Irwin: Thank you Chairman Russman, members of the committee. For the record My name is Tom Irwin. Conservation Law Foundation. On March 31, 1999, Conservation Law Foundation submitted a letter to this committee expressing it's concerns relating to sludge and voicing it's support for a particular aspect of this bill, specifically, Senator Wheeler's amendment to this bill, prohibiting the use of class B sludge and industrial sludge for reclamation of gravel pits. That letter, the March 31 letter, included a long list of scientific concerns and questions expressed in the 1998 task force report that was prepared by the UNH cooperative extension. I won't go through that long list of concerns at this point, but would state, generally that CLF based on those concerns advocates a cautionary approach with respect to use of sludge for land application. As stated in the March 31 letter, CLF is specifically very concerned with the use of sewerage sludge and industrial sludge for use, for reclamation of gravel pits and when I mention sewerage sludge, we are concerned with the use of both class A and class B for that purpose. Basically, excavation on sites we feel warrant special protection, they are located over aquifers, they contain porous soils and materials through which contaminates can easily reach those aquifers, ground water resources, and obviously, when excavation activities have taken place at these sights, they greatly expose those water resources to actual contamination. Using sewerage sludge to reclaim these areas, we feel raises serious concerns, specifically, referring back to the task force report. We feel the following concerns are particularly relevant to the issue of reclamation of gravel pits by using sludge. First, there's a potential for organic compounds and excessive nitrates to contaminate the surface waters and ground water. Second as recognized by the task force report, there are uncertainties regarding the behavior of metals in ecosystems, including the manner in which metals may pair up and the mobility and effects of complex metals on water quality. There is a potential for pathogenic viruses and intestinal parasites such as cryptosparidium to be present in sludge, which raises the concern, these organisms potentially contaminating ground water resources, and I would note that at least with respect to the first of these two concerns, the issue organic compounds, and the issue of metals. These concerns are equally applicable to class A and class B sludges, therefore, once again, CLF not only supports Senator Wheeler's amendment which calls for the prohibition of class B sewage sludge for reclamation , we would further advocate the prohibition of the use of class A sewerage sludge for reclamation purposes. With respect to industrial sludge, CLF is particularly concerned with the potential for dioxins and organic compounds to cause contamination

of groundwater resources. Finally, the rules most recently promulgated by DES, pertaining to sewerage sludge requires that reclamation sites be monitored, that basically, ground water management plan be put in place when sewage sludges are used for reclamation purposes. We feel that this requirement is in acknowledgement of the serious concerns relative to reclamation sites. We also feel that monitoring in this manner basically, allows the contamination to occur and then requires that the contamination be cleaned up. It's our strong position that prohibiting the use of sludge in reclamation gravel pits, will protect New Hampshire's aquifers, it will prevent the contamination from occurring in the first place, and will avoid the cost associated with then remediating any contamination that occurs.

Senator Richard L. Russman, D. 19: Thanks very much for your testimony. The Chair would recognize Henry Veilleux.

Henry Veilleux: Thank you Mr. Chairman, members of the committee. For the record, my name is Henry Veilleux, and I'm here on behalf of Wheelabrator Bio Gro. I passed out a letter from Ann Bosiak, she's a technical services coordinator with Wheelabrator Bio Gro, which goes into detail. [Attachment X].

Senator Richard L. Russman, D. 19: Questions? Thanks very much for your testimony. Chair would recognize Caroline Snyder .

Caroline Snyder: Good afternoon, Chairman Russman, members of the Environment Committee, thank you for the opportunity to testify in support of Senate Bill 218. This is a modest bill it's not a radical bill, but it's very necessary, it's necessary because the current state rules are not protective of human health, of the environment or of long term agricultural productivity. You've heard Mr. Currier testify earlier today that he plans to put together a panel of experts to advise DES. DES has had a chance to do that now for two years. They have had a technical advisory committee that's dominated by the industry. They have, however, had a tremendous amount of input from experts in this field . We have provided them over fifty peer viewed recent articles and a lot of data and they seem to have ignored these experts. They have ignored recent data and sound science, they've ignored EPA guidelines how to protect potable groundwater, they've ignored EPA guidelines on the data of the hazards of dioxins they've ignored the advice of their own UNH scientists, they've ignored northeast guidelines for land application, they

exist. They are beautifully spelled out written in wonderful English. They could be used but they're being ignored by DES. They're also ignoring the recent findings and warnings about arsenic in drinking water, and they're even ignoring the recommendations of New Hampshire Bureau of Health, it's assessment on metal limits. The New Hampshire Bureau of Health Risk Assesment, recommends the same metal limits that this bill, 218 recommends. They are in the 99th percentile of New Hampshire sludge, which means 99% of New Hampshire sludge could meet it and only one percent could not. Sludge is very very difficult to regulate, because it's not a uniform product, it differs from batch to batch. One week you can have a batch that meets the northeast guidelines and the next week you can have a batch from the same treatment plant that is so contaminated that it has to be qualified as hazardous waste. The farmer never knows what he's getting. Ideally, every load has to be tested, not only for the nine heavy metals or the two hundred toxic organics, but for the tens of thousands of other contaminates that are in sludge ... The northeast with it's limited farmland, with it's low quality sludges, with it's high water tables, with it's very acidic and shallow soils, it's the least suitable place for sludge application. If you're going to do it at all, you should do it with extreme caution. This bill, although it will not make sludge spreading safe, it will make it safer, as was said earlier today. DES has provided written testimony against this bill saying that many of the provisions in it are arbitrary restrictions. We do not believe these restrictions arbitrary, we believe that they are based on sound science, and we are very surprised at municipal association that believes that science based rules should govern our sludge land application programs are not supporting this bill, because this bill is based on science whereas the EPA guidelines are outdated based on a flawed risk assessment and the new state rules are very close to that. Because DES has said that these provisions are arbitrary, we are submitting additional supporting material. If you could please pass this out to the Senators, I would appreciate it. I want to quickly, very quickly, go over this material [Attachment Y].

Senator Richard L. Russman, D. 19: Thank you. Question from Senator Cohen.

Senator Burton J. Cohen, D. 24: I was very interested to see this C3, but I don't seem to have C3.

Caroline Snyder: It was sent to you earlier, the sponsors of this bill, four of you, I sent you a package that had the Shane O'Connor description of what happened in Greenland. So, I didn't attach it again, but the other four

Senators were not sponsors of it. But, I can give you a copy, I have an extra copy.

Senator Burton J. Cohen, D. 24: I would like to see it. One further question. Do you happen to know what Vermont is doing? There's a lot of dairy in Vermont. What are they doing in regards to...

Caroline Snyder: Yes. That's another point. I would like to say that this bill makes New Hampshire bills comparable to the other New England states. Vermont, at least, has a six month waiting period, for cattle, for grazing. We only have forty five days. Vermont, we have another person testifying here later who will actually describe the differences between our laws and their state laws, and she will go in great detail, but there are certain aspects in Vermont's laws that are certainly more protective than our current laws. In fact, this bill, we actually look at the New England laws and try to pick out the best features. The most protective features in Maine, Vermont, Massachusetts and well, from those.

Senator Richard L. Russman, D. 19: Further Questions? Thank you very much for your testimony. The Chair would recognize Sheilagh Connely.

Sheilagh Connelly I am today going to be representing the organization called the New Hampshire Water Pollution Control Association which I'm a member of the biosolids committee. We would urge the committee to vote inexpedient to legislate [See attachment Z]

Senator Richard L. Russman, D. 19: Question? Yes Senator Cohen.

Senator Burton J. Cohen, D. 24: Just a quick question. Early on you testimony you mentioned some products that you could by at Home Depot and places like that. Could you tell me the names of those I want to make sure that I never buy them.

Sheilagh Connelly: Melorganite. There's actually a few more that you can.. make sure that when you buy something you ask them, specifically what's in it. It will be on the label as well if you don't want to have it.

Senator Richard L. Russman, D. 19: Senator Below.

Senator Clifton Below, D. 5: Thank you. A couple of questions. One, do you happen to know how with the heavy metal content of commercial fertilizers is compared to sludge.

Sheilagh Connelly: It varies. There are some commercial fertilizers that have less amounts, there are some pig manure that have higher amounts. An area that I always find interesting is raw phosphate, its typically mined out of Florida, has higher cadmium than you'll find in any biosolids generated anywhere in New England, and that's a certifiable organic farming material. It really ranges. One of the biggest differences that I look at is really that bio-solids is really the most researched and the most regulated material out there, and the practices that go into it and the testing that has to be done to insure proper agronomic loading rates and tracking and setbacks. It goes well beyond any commercial fertilizer that manure management that folks will ever get. Without a doubt.

Senator Clifton Below, D. 5: Are you suggesting it's conceivable that in some instances if a farmer switched commercial fertilizers with some toxins or some heavy metals they may actually end up depositing more than if they were using sludge.

Sheilagh Connelly: It's a possibility. I would just point out to you along that theme. Tadmore farm up in your district, Mike Townsend testified here last time, his farm does a mix of manure and biosolids, and they've been using it for five or six years, and that's the sight of the UNH research project. Their farm has actually cleaned up the surrounding water quality by following the bio-solids regulations and best management practices, and they've extended those practices and that soil testing and those nitrate loadings to their manure management based on what they've seen in terms of results in terms by using the biosolids. Right now, there's a huge initiative out at USDA and EPA on water quality for Chesapeake bay Region, Chaplain, all the major great lakes that have become depositories from run off from agriculture, and they are now looking towards the biosolids industry and users to show them techniques and ways to clean up the water quality based on what we've been doing for the last twenty years.

Senator Clifton Below, D. 5: One more question. Do you have the list of municipalities in New Hampshire that produce class A vs. class B. I think somebody's given us the list of those that do class B.

Sheilagh Connelly: I can get it for you. ...to finding a solution if this isn't the one we're comfortable with at least then people know we've got to do something.

Senator Richard L. Russman, D. 19: Thanks very much for your testimony. The Chair would recognize Chris Rueggerberg.

Chris Rueggerberg: Good afternoon, my name is Chris Ruebberberg and for the record, I am representing the Sierra Club and we support the passage of Senate Bill 218 with the proposed amendment by Senator Wheeler. [AttachmentAA]

GAP IN TAPE... Change TO TAPE THREE

Testimony of Dan Holmes already in progress [See Written Testimony Attachment DD].

Senator Richard L. Russman, D. 19: Any questions? Thank you for your testimony. Chair would recognize Ralph Kirshner from Center Harbor[Attachment FF].

Ralph Kirshner: Thank you Mr. Chairman, as most of you are aware, I'm a Resident of Middlebury Island on Lake Winnipesaukee which is technically in the town of Tuftonborough, and I drink water out of the lake so I'm not concerned with the water quality, and a lot of the testimony today seems to be on fairly technical grounds of percentages and parts per million and so forth. That makes very little difference to the people who drink the water. They want to know whether it's a health risk to them or not. They also want to know what it going to cost them to clean up the water if it is a health risk, and then it becomes a question of who pays. Do I pay or does the paper industry and waste industry pay. Now obviously they can recover it from their user fees. I can't. I'm very well aware of what happens when I flush my toilet. I check my system frequently. More often than annually. I've had to have my septic tank pumped once in thirty years, and that was when I had

the tank replaced because it was rusting out, and I assure you nothing went into that tank that shouldn't have. Unfortunately, that's not the case for most people, particularly in urban areas, particularly in areas like Lowell where we're taking the sludge, and even more particularly in areas like New York City which is now shipping sludge by the trainload to Texas. New Hampshire's an awful lot closer than Texas. Who knows what's going in this stuff, I don't. Unfortunately, in New Hampshire, the agency responsible for regulating sludge is also a major producer of sludge. DES runs the Winnipesaukee river basin plant in Franklin, which is one of the plants that has been mentioned as not being updated to produce class A sludge yet. When we put producer in charge of regulating, there's a built in conflict of interest, and that conflict, unfortunately, was created by this legislature and therefore it's up to the legislature to resolve it , otherwise, we're in the situation of putting Exxon in charge of tanker safety or why don't we go to the state prison and have the inmates be in charge of the rules for enforcing the criminal code. When they have the conflict of interest the legislature has to take over. I'm going to repeat everything that you said previously, I would like to point out that existing law is far more stringent than this bill, if existing law were enforced by DES. RSA45;17 concerning pollution, says that anybody putting anything in or near a lake, pond, reservoir or stream tributary thereto that may cause such water to become impure or unfit, is committing a crime. Basically, if that law were enforced, any application of sludge anywhere near a stream, anywhere in this state would be illegal. That covers just about the whole state. We also have a law, which is RSA 155E concerning gravel pits and reclamation which says that except for exposed rock ledge, all areas which have been affected by the excavation shall be spread with topsoil or strippings. Sludge is not topsoil or strippings. RSA 155E;5 were enforced, there would be no spreading of sludge or paper mill waste on gravel pits because it's not soil or strippings. Unfortunately, we don't have the enforcement of existing law that we should have, and we're left with two alternatives. One is to enforce that law. The other is Senate Bill 218.I will leave you with that. I will leave you with a copy of my written testimony, which you may have gotten back in March when I couldn't attend, and I'll be glad to answer any questions.

Senator Richard L. Russman, D. 19: Thanks very much, questions? Thanks very much. Did you want to speak Jim Ruebens.

Jim Ruebens: Thank you Mr. Chairman My name is Jim Ruebens from Hanover representing Think New Hampshire we're an organization which is largely Republican in makeup and we've taken a position in opposition to New Hampshire's excessively lenient sludge spreading legislation, however,

personally, I'm not qualified nor are we, to endorse or oppose each and every word of the bill, some of it is technical but clearly we're here in support of sludge regulations that are more directed at conservative limits, science based conservative limits to application rates than the limits that are now in place. Generally, I'm loathed to recognize any action by legislature to micro-manage regulatory apparatus in this case very technical, but in this case, the department of environmental services has been pointed out as a duel role of both promoting and regulating the application of sludge and the organization has become captured by the industry it regulates and is therefore not protecting the public health and safety at this point. Industry capture. That as prior person giving testimony pointed out, requires the legislature to step in. The issue here is, in conclusion, pretty simple, we're talking about, in general, saving twenty, thirty bucks a ton for example, Springfield and Lowell Massachusetts so they can spread sludge in New Hampshire. That's what the issue comes down to. We're balancing that. Yes, there would be an increased cost to Lowell and Springfield, Mass. if they could not split and spread some of those materials here. We are balancing that off against the need to prudently protect public safety. If this issue were, for example, the way we regulate prescription drugs, they must be proven safe and effective prior to their being allowed to be ingested into the human body. This is very similar because sludge contains materials we know to be toxic like live virus, dioxins, radioactivity, heavy metals, and their clearly established pathways into the human body through food and water, particularly on agricultural land and near water tables as the bill addresses the issue of very proximate spreading of industrial sludge to water tables and reclamation land. It would, therefore, in a very parallel basis require the legislature to exercise the same kind of prudence in the management requirements for sludge. If it can get into the human body, it's known to be harmful then exercise scientific caution. So the legislature needs to step in because of the fact the industry has captured the regulatory apparatus in the state and by default, you folks need to protect the public health and safety in our state, thank you very much.

Senator Burton J. Cohen, D. 24: Any Questions? Senator Johnson. Thank you .

Senator Carl R. Johnson, D. 3: Senator Reubens, so are you saying that the current regulations that DES has are not scientifically supportable?

Jim Reubens: No, on the basis of, for example, Springfield Massachusetts, sludge containing radioactivity and on the basis of the test frequency not being sufficient for those people on whose land this material is being spread

in New Hampshire. To know the extent to which human health and safety is being impacted, absolutely not. The dioxin issue has been discussed. I don't need to rerehearse that. The more we learn about it the more we learn that we should be minimizing, perhaps at a very aggressive degree, minimizing the extent to which this material is brought back in greater quantities into the human food chain, through application on agricultural grazing land. It may make no sense whatsoever to put any of it on such land or on water tables on reclaimed gravel pits. Again, arguing that we exercise scientific conservatism because these materials have clear pathways are known to be toxic into the human body.

Senator Burton J. Cohen, D. 24: How well could that, the DES requirements counteract ... twenty five feet, spreading from water by .....

Jim Ruebens: I'm not qualified to make a statement on that .

Senator Richard L. Russman, D. 19: Further Questions? O.k., thank you. Is there anybody else that wants to speak on...

Chip Chesley: Thank you. You've had a long day, I'll keep my comments short. My name is Chip Chesley. I'm the public works director for the community of Merrimack New Hampshire. We are a community that's had a long standing commitment to clean water. We were the first community in New Hampshire to build a secondary waste water treatment plant thirty years ago. On our twenty fifth anniversary, we received an award for United States EPA's best operated and maintained facility in the country and we compete with sixteen hundred other plants in the country. I think that's a noble award. The following year we won an award from the American Society of Civil Engineers for our composting plant which I'll speak to later, and just received a nomination for our pretreatment program from U.S EPA. So, in brief, I think our efforts at clean water are notable, but we also have the experience of thirty years behind us in producing the material that we're discussing today called sludge. And we basically looked at and tried every method possible. Initially, when our plant operated, we were so happy with the plant we kind of ignored what's going on in the back end of the plant but we soon realized that we had to do something with that material. We began to bury it. It was soon realized, in Merrimack, that we didn't have a balanced horizon, that there were limits that we could not fill every hollow in Merrimack with a product . And then we spent millions of federal dollars, millions of state dollars and some of our own dollars to build an incinerator. I

guess a technology in incineration is, if you have a problem lets use a nonavailable resource such as fuel oil and burn it make that problem smaller. It reduces the volume by 90%. Extends the volume of landfilling. We tried that for a while and then we recognized that the product we're producing, has benefit. We can live in a sustainable economy. Then we started a compost and in this instance, we spent millions of local dollars, a million of state dollars and no federal dollars to build that facility and we built a class a composting facility. We find ourselves somewhat paradox in that about 80-85% of the material that we produce, is marketed outside of the state. Apparently we get better revenue for our products than New York State, Connecticut, Massachusetts, and Rhode Island, than we do in New Hampshire. So, hence, we market there. So that very little of our product is actually distribute in New Hampshire. About 20% of it. But, given that, though we do market in New Hampshire, this bill would have an impact to our operations. Now, I've heard some testimony today that it takes DES to tax. ... there's been times when I've taken DES to tax and I can understand that. But there is something in our New Hampshire Constitution that says if the legislature is going to step in and come with the New Hampshire difference we have the federal difference here, we have the New Hampshire difference up there and I don't think anyone disagrees with that to play to a higher standard. The New Hampshire legislature also has a financial obligation to pick up that tab. So, I think that's one thing that as we discuss this issue, we have to look at that tab and where it's going to go. And I was encouraged to hear discussions Previously about funding, about having class B operations come to class A, and I would hope that that funding is retroactive 'cause Merrimack already made that expenditure in 1994. Merrimack isn't in the business of handling sludge by itself. We also take about forty percent of the material that Nashua handles right now, all the material that Henniker produces, all the material that Durham produces. We also receive material from an airforce tracking station in New Boston. So this really isn't just a Merrimack issue, I think I'm speaking with some concerns with some of the other communities that share our facility with us. In brief, I would recommend to this group that you've heard an awful lot of testimony, a lot of it had TPT, PKM, long list of names next to it. It is a very complex subject. One that I'm the guy at the .... Plant that's made it a profession to study what happens when you flush. You don't care about it, but I do. It's a very complex topic. I would encourage this committee to study this much further before you take any action on that because one, it has tremendous financial implications. We've just gone through a very tough challenge in this body to come up with the education issue. I think we've got to study what it is that we're dealing with because there is a cost to come up with the New Hampshire Difference and the second issue is will we make that decision. It should be an educated discussion and you folks should have the benefit and the time to consider all the issues that you've heard by all the folks behind me, cause there's a broad range of issues

here and it's not something that I would think if I were in your shoes I would want to make that decision instantaneously and bring it to the full floor of the Senate.

Senator Richard L. Russman, D. 19: Questions? Thanks very much for your testimony.

Senator Carl R. Johnson, D. 3: Have we reached a level of violating 28-A yet?

Chip Chesley: I think if this bill passes, I would advise my selectman that the town of Merrimack is going to incur additional costs to the passage of this bill. I would also so advise my selectman to advise those bodies of the other communities that we serve.

Senator Richard L. Russman, D. 19: Is there anybody else that feels compelled to testify on Senate Bill 218? O.K., we'll close the hearing.

HEARING CLOSED

*Respectfully Submitted,*

*Anna-Maria Tsorvas*
*Committee Secretary*

Date: May 6,1999
Time: 1:15PM
Room: LOB201-203

The Senate Committee on Environment held a hearing on the following:

SB218-FN-L regulating the land application of sewage sludge.

Members of Committee present:

Senator Russman
Senator Cohen
Senator Below
Senator Johnson
Senator Krueger
Senator Wheeler

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The Chair, Senator Richard Russman, opened the hearing.

Senator Richard L. Russman, D. 19: I'd like to open the hearing on218-FN. We started this hearing sometime ago. It's a continuation. There is an amendment that Senator Wheeler has proposed. She is going to introduce that or reintroduce that shortly, and certainly we'll go from there and if you've already.... O.k. go ahead Senator.

Senator Katherine W. Wheeler, D. 21: Thank you very much Chairman Russman, and members of the committee for letting me reintroduce the amendment to Senate Bill 218. It is the amendment numbered 0674S and dated March 31, 1999, which is replacing the section two of the bill. I just want to refresh your memories about what this... I'd like to go through it with you if you don't mind too much. I'll try to make it pretty quick. Section one in the original bill as introduced is just the notice of septage or sludge spreading. The amendment does not affect that. It's just where it gets recorded and what needs to be recorded and you can read through that on your own. The section two, which is the amendment, is talking about how the land application of sludge is regulated, and in roman numeral one, we say that if they're going to be land applied in New Hampshire, the rules or regulations of the State of New Hampshire or the state in which the sludge

was generated, whichever are more stringent will be adopted. This was passed in 1998 it's not new, but it's restated in Roman numeral one. Roman numeral two clarifies that we are talking about class B sludge. If it's for grazing animals or where forest crops are being grown it should be turned over into the soil immediately, so that it can't run off or be eaten by grazing animals or blown into homes containing the pathogens which it might have, so we are saying that if its on... if that's where it is it needs to be turned over and not just left on top of the soil. Roman numeral three, is prohibiting it, class B sludge from being applied to forest land or newly clear-cut areas so that it would eliminate class B sludges use in forest because it has no nutrient value for forests and it, indeed, adds stress to forests. Class B sewage sludge, Roman four, and industrial paper mill sludge, shall not be used to reclaim spent gravel pits above aquifers. What we have been doing in New Hampshire with gravel pit reclamation violates the federal regulations regarding nitrates leaching. We need to be very careful about what we do with our aquifers. Roman numeral five, the pH reading of between 6.5 and 7 shall be maintained. That's saying that you can't just put the sludge there and forget about it because there is a symbiotic relationship that happens and once a fill has been treated the metal.... gap in tape...so it expands the rivers management protection program to surface waters in general which we feel that one of our goals to protect New Hampshire's water quality. Roman numeral seven is the minimum distance of three feet between seasonable high water table and the lowest point of the land application of sludge. We obviously don't want the water table to reach the sludge. That would not be environmentally good or good for our health. Roman numeral eight, now here we talk about class A and class B sludge shall not be stockpiled on land or applied on hundred year floodplains. The floodplains are defined by the U.S. geological survey. Stockpiles may be placed on sites that are not floodplains up to and including thirty days before any planting or seeding. Sludge shall not be stockpiled where there is less than four feet of unsaturated soil. You can read that. This is, again, a protection measure. Roman numeral nine, class b sludge shall not be applied to agricultural land which ha s a slope greater than eight percent. Because of runoff we have this. The town of Bristol ordinance prohibits sewage sludge because the town is so hilly. They didn't want to have to deal with the runoff problems that's why this is there. Deliveries of class A sludge exceeding twenty tons per sight per year should be reported to the department that just makes sense. The next page of the amendment is the list of the metal concentrations. Changing the maximum metal concentrations. If you look at Roman numeral three, it says sludge quality certification shall expire two years from the date of issuance. Those are in the current rules, but the DES new rules are for five years and we think that's too long and that two years is appropriate. That's what we had and we think it should stay that way. Roman numeral four, adhering to the New Hampshire Cooperative Extension Services best management practices.

That's what we've always had, but the new DES rules allow UNH best management practices, or in certain cases, the standards from industry which I believe puts the regulator in charge of the product, and so that's why this is in here to remind us that those best management practices should be adhered to. Then on line twenty-seven, dioxin. We need to talk about dioxins in our law, and this is a response to the DES criticism of our bill. The dioxin language was too vague. This is putting, I think, a more specific language in. Mainly, our goal is to keep dioxin out of the food chain. It is one of the most dangerous substances. Our tolerance is reduced the more we ingest. It can be in air, it can be in water, it can come everywhere. Dioxin is very dangerous, and we want to reduce it so that we're not having our children, our elderly and the rest of us, subjected to it. So, you can read all that about dioxin. The compliance shouldn't be too burdensome with this because we're always being told that New Hampshire is producing low metal content sludge. If that's true, then we shouldn't have any trouble with complying with this bill. These new metal standards are affecting what I believe is an artificially high fiscal note, however, these are the standards that DES originally proposed for the year 2001. When industry objected the standards became voluntary. I don't think we should have voluntary standards in something that's this important. As I've said, we have a UNH professor who's always argued that New Hampshire produces sludge that's low in metals and if this is true, the industries will have no trouble meeting the new maximum metal concentrations and the sludge will not have to be landfilled. Senate Bill 218 does not require landfilling as the only option for sludge disposal, it just regulates sludge used for agricultural applications because we want to keep it out of the food chain. People who like to eat it sometimes demonstrate how safe it is, but I honestly don't believe that we want to give it to our children day after day. UNH cooperative extension recommends that in order of priority sewage sludge first be applied to non-agricultural land. It can be used for capping landfills, roadside restoration and athletic field renovation landscape sights, etc. This is not a total ban on sludge; it's just saying let's keep it out of our food chain. Thank you very much for your indulgence on letting m present this amendment again and I won't take questions because there's going to be a ton of people...

Senator Richard L. Russman, D. 19: Anybody have any questions? I have one relative to the reason for B not being applied to forestland.

Senator Katherine W. Wheeler, D. 21: It's my understanding that it really isn't helpful for forests, but I trust they'll be some plant biologists or somebody who could expand upon that for you.

Senator Richard L. Russman, D. 19: All right. Go ahead Senator Below.

Senator Clifton Below, D. 5: Thank you, Mr. Chairman. Senator Wheeler, on page one of your amendment, lines twenty three through twenty seven referred to class A and class B sludge which I think are all kinds of sludge... correct.. not being stockpiled, one hundred-year floodplains. I don't know if this is true or not but it occurs to me that most sewage treatment plants are often in or very close to just above the hundred year flood plane and so as sewage treatment plants compost their sludge then they in fact, stockpile it next to the sewage treatment plant which may be in the hundred year floodplains. Is it your intent that where it's being generated. Does this apply as well if it's next to a sewage treatment plant?

Senator Katherine W. Wheeler, D. 21: If it's a hundred year floodplane or there's less than the four feet of unsaturated soil, as stated in there, yes I think it's....that is my intent. I would be open to considering an exemption but I haven't proposed one at this time.

Senator Richard L. Russman, D. 19: Questions? It sounds like the... on the land applied on hundred year floodplain that ... how much, percentage wise, you know how much land that would affect.

Senator Katherine W. Wheeler, D. 21: No, I don't.

Senator Richard L. Russman, D. 19: Further questions from the committee? Thank you very much for your testimony. Chair would recognize senator Disnard.

Senator George F. Disnard, D. 8: Thank you Mr. Chairman. Members of the committee, for the record, I'm Senator George Disnard [See written testimony Attachment O].

Senator Richard L. Russman, D. 19: Thank you very much. Questions for the Senator? Thank you very much for your time, for coming here. Chair would recognize...

Representative Derek Owen: Thank you Mr. Chairman. For the record, Representative Derek Owen Merrimack County, District 6, and I'm obviously in support of the bill, also in support of Senator Wheeler's amendment. I'm going to speak only to one part of the bill in particular to keep my testimony short, and it has to do with dioxin. I don't know how many people here are familiar with Love Canal. Most people with any environmental thoughts would remember Love Canal and Lois Gibbs. I have relied on them for considerable information, and just for one segment of it, I'll read you off a couple of overall health effects associated with dioxin and dioxin-like chemicals. For one you have a cancer soft or connected tissue, lung, liver stomach non-hodgkin's lymphoma, metabolic hormonal changes including altered glucose tolerance and decreased insulin levels leading to increased risk of diabetes. I don't want to bore or excite the committee to much with the volume of information I have and I will submit it for testimony if I may. [Attachment D].

Senator Richard L. Russman, D. 19: Questions? Senator Below.

Senator Clifton Below, D. 5: Thank you. Representative Owen, the standards you were citing for dioxins seem to be lower than what's suggested in the amendment.

Representative Owen: Yes, they are.

Senator Clifton Below, D. 5: Do you know what references dioxins TEQ or one ppt... What's the TEQ stand for?

Representative Owen: The total dioxin equivalence and I believe that there is a professional in the background who can probably bring you up to the scientists point of view better than I. Professor Snyder will be testifying.

Senator Clifton Below, D. 5: So you're advocating that it go at least this far perhaps, further.

Representative Owen: Absolutely.

Senator Richard L. Russman, D. 19: Thanks very much for your testimony. Chair would recognize Paul Currier from DES speaking against the bill.

Paul Currier: Thank you Mr. Chairman. I have a letter of testimony and some attachments [see attachment Q].

Senator Richard L. Russman, D. 19: Questions? Senator Below.

Senator Clifton Below, D. 5: Thank you. The proposed sludge management advisory committee is that appropriate for legislative action or is this something that would constitute departmental initiative.

Paul Currier: We had proposed it to be a department initiative.

Senator Richard L. Russman, D. 19: Senator Wheeler.

Senator Katherine W. Wheeler, D. 21: Thank you. Thank you Senator Russman. Do you have the names of the people that are going to be on that committee yet or are you not...

Paul Currier: No, we are in the process of sending out letters. We have a proposed membership, which includes constituency very sufficiently. We're open to suggestion on that. We have not and our proposal is that the membership will be by invitation to the various constituencies, but we're open to suggestions.

Senator Katherine W. Wheeler, D. 21: Pardon me, is that in the material you've given us, that proposal?

Paul Currier: Yes, it is. It's the next to the last one, or the last one, exuse me, attachment four.

Senator Katherine W. Wheeler, D. 21: Oh, thank you.

Senator Richard L. Russman, D. 19: Senator Below.

Senator Clifton Below, D. 5: Thank you. Mr. Currier, is there anything in the bill that you feel the department would feel merits legislative action at this point or are you saying that you feel the entire bill is unnecessary.

Paul Currier: Right, we think the bill is unnecessary and in fact preempts our mission.

Senator Richard L. Russman, D. 19: O.k., further discussion? Thanks for your testimony, and I will tell ya up front, I do not expect to be calling on people that have testified back at our April first hearing if they've already had one bite at the apple in terms of their testimony so if you have testified previously, I cant guarantee that you're going to be called on today. O.k., the chair would recognize Paul Adams from Chichester, I believe it is.

Paul Adams: Yes sir, my name is Paul Adams and I've been asked to testify by one of the legislators. I represent a group called Technical Assistance for Pollution Prevention Incorporated, and we provide pollution prevention assistance to anyone in New Hampshire on a non-regulatory, non-profit, free, confidential basis. This group is an outgrowth of the New Hampshire Pollution Prevention Program which was established in 1991 and the five sponsoring members of this group four original members from 1991 and the fifth person is a Professor at Dartmouth College. I neither advocate or oppose the use of sludge, but there is a way to get the heavy metals, dioxins, and other chemicals out of the sludge, and I think the whole sludge debate had ignored this issue. Where do these metals and chemicals come from? This is the database of hazardous waste generators in New Hampshire, 11,000. of them. They are known. They are not all active. Those who are active have to submit hazardous waste manifests when they take hazardous waste off sight, out of state, wherever. They tell us what kind of waste it is. There is no reason why you cant go to these industries generating this waste and assist them in reducing the heavy metals. Over the past seven years, I have visited thirty four industries, numerous sewerage treatment plants, hospitals and other industries, and I find that industries are all willing to reduce the waste they put down the sewer if they're given assistance.....

END OF TAPE ONE SIDE ONE

...they wash the floors and it goes down the sewer, and we can't forget what shows up in the septage. People have a tendency to just get rid of their noxious waste down in the toilet. Household hazardous waste days eliminate some of this. I think the DES should come up with some sort of a no toxics to toilets program to eliminate this amongst other things. We find, in New Hampshire that to discharge water to a lake, river or stream, you have to have what is known as a MPDES, a pollutant discharge elimination system. Forty-six of the ninety-six POW's the privately owned treatment works, the state-controlled works in New Hampshire have lapsed permits. What does that mean? Well, EPA will tell you, even though they're lapsed they're still in effect because we're monitoring them. Well what it means is the public hasn't had a chance to look at the heavy metals limits put on industry by these permits. New Hampshire does not issue these permits. EPA region one in Boston does because New Hampshire has declined to take this authority. TAP is looking at a project in conjunction with Vermont to address the upper Connecticut River watershed. In that particular watershed, Twenty-four out of thirty six MPDES's are non-valid. As you may know, discharges to the Connecticut River through Vermont are controlled by New Hampshire. Back in July of last year when the sludge manager had a public hearing this little handout was given and it showed that even with the new limits, under eight hundred, five out of ten metals missed the limit standard. That's pretty exceptional quality. The limit standards for other sludge were missed by nine out of ten facilities. DES made some good proposals at that hearing, amongst them they're going to give assistance to land applying POTW"s. That's where you start. The guy's landapplying. To help them reduce their contaminate loadings. They're going to come up with a program they propose for twenty percent state grants and low interest loans, then their proposed going to the legislature for get some grant assistance. There are other ways to solve this problem. The community Development Block Grant Program, for example, Colebrook just received a seven hundred thousand dollar grant because "a lapsed MPDES"... might have been a discharge permit. Perhaps they can come up with an emissions trading program like the air trading . If you get one industry that produces heavy metals consistently below those allowable, he can trade off the difference to some industry who can't reduce his metals because of some particular process. EPA just issued the nineteen ninety nine state of the New England Environment bulletin and I would like to point out to you that in there, under the toxic release inventory , once every year, those emitting toxins beyond certain limits have to report to EPA. In 1997, New Hampshire was the only state to have an increase in toxic release to the atmosphere. That basically summarized what I wanted to say. I think there is a way to get the metals out, and hopefully soften the sludge debate. It takes money, it takes attention, it takes time, and that's why I formed this group. To give them that attention and time. Thank you.

Senator Richard L. Russman, D. 19: Questions for Mr. Adams? Thanks very much for your testimony. The Chair would recognize Alex Duran from BFI organics.

Alex Duran: Thank you Mr. Chairman, members of the committee. For the record, my name is Alex Duran, I'm an environmental engineer with BFI organics . One of the firms managing organic residuals in New Hampshire and adjacent New England States. Thanks for the opportunity to provide this testimony. [Attachment R]

Senator Richard L. Russman, D. 19: Thank you. Questions? Thanks very much for your testimony. The chair would recognise Katherine Rhoda from Bethlehem.

Katherine Rhoda: Thank you. My names Katherine Rhoda, I'm a citizen of Bethlehem, New Hampshire. [Attachment S].

Senator Richard L. Russman, D. 19: Thank you, Questions? Thanks very much for your testimony, Chair would recognize Judith Silva from the New Hampshire Municipal Association.

Judith Silva: Good afternoon, Mr. Chairman, members of the committee. My name is Judy Silva I'm from the New Hampshire Municipal Association and I appear here this afternoon in opposition to this bill.[Attachment T,U]

END OF TAPE 1 SIDETWO

Senator Richard L. Russman, D. 19: Thanks. Questions? Thanks very much for your testimony. The Chair would recognize Shirley Grilli.

Shirley Grilli: My name is Shirley Grilli, and I'm from the town of Haverhill. I appreciate being able to talk to you today. Basically, I just wanted to talk you as a resident of the North Country. Haverhill is a dairy area and we have a lot of large dairy farms. It's also a very beautiful area

and we have a lot of lakes and streams. I'm urging you to vote in Favor of Senate Bill 218. [Attachment V].

Senator Richard L. Russman, D. 19: Questions? Thanks very much. Chair would recognize Brenda Clemmons.

Brenda Clemmons: Thank you Mr. Chairman, members of the committee. I'm the Public Affairs Director for the New Hampshire Farm Bureau. Thanks for the opportunity to express our concerns regarding senate Bill 218. [Attachment W]

Senator Richard L. Russman, D. 19: Thanks very much. Questions from the committee? I have a question for you . Prospectus wise, how many acres of land do you represent ?

Brenda Clemmons: I don't have that particulars.

Senator Richard L. Russman, D. 19: Percentage wise how much sludge is being spread over.

Brenda Clemmons: I believe twelve. Landbased I don't have that answer but there's about two hundred farms that actually utilize biosolids in the state. But I don't have the percentage and perhaps DES would, could provide that.

Senator Richard L. Russman, D. 19: Alright, Senator Cohen.

Senator Burton J. Cohen, D. 24: Thank you. I understand the challenges facing the agricultural community ...You mention that as compared to fertilizers, sludge is provided virtually no cost. What about the cost of cleaning up the water? How is that to be paid?

Brenda Clemmons: Farmers are... use all of the products whether it's commercial fertilizers or biosolids or on sight resources very wisely. They're very, very careful to protect the water resources. They use them, they drink

them. They're very concerned about that. They do not, they will not, intentionally hurt the water resources . Further Questions ? Thanks very much Brenda for your testimony. Chair would recognize Tom Irwin.

Tom Irwin: Thank you Chairman Russman, members of the committee. For the record My name is Tom Irwin. Conservation Law Foundation. On March 31, 1999, Conservation Law Foundation submitted a letter to this committee expressing it's concerns relating to sludge and voicing it's support for a particular aspect of this bill, specifically, Senator Wheeler's amendment to this bill, prohibiting the use of class B sludge and industrial sludge for reclamation of gravel pits. That letter, the March 31 letter, included a long list of scientific concerns and questions expressed in the 1998 task force report that was prepared by the UNH cooperative extension. I won't go through that long list of concerns at this point, but would state, generally that CLF based on those concerns advocates a cautionary approach with respect to use of sludge for land application. As stated in the March 31 letter, CLF is specifically very concerned with the use of sewerage sludge and industrial sludge for use, for reclamation of gravel pits and when I mention sewerage sludge, we are concerned with the use of both class A and class B for that purpose. Basically, excavation on sites we feel warrant special protection, they are located over aquifers, they contain porous soils and materials through which contaminates can easily reach those aquifers, ground water resources, and obviously, when excavation activities have taken place at these sights, they greatly expose those water resources to actual contamination. Using sewerage sludge to reclaim these areas, we feel raises serious concerns, specifically, referring back to the task force report. We feel the following concerns are particularly relevant to the issue of reclamation of gravel pits by using sludge. First, there's a potential for organic compounds and excessive nitrates to contaminate the surface waters and ground water. Second as recognized by the task force report, there are uncertainties regarding the behavior of metals in ecosystems, including the manner in which metals may pair up and the mobility and effects of complex metals on water quality. There is a potential for pathogenic viruses and intestinal parasites such as cryptosparidium to be present in sludge, which raises the concern, these organisms potentially contaminating ground water resources, and I would note that at least with respect to the first of these two concerns, the issue organic compounds, and the issue of metals. These concerns are equally applicable to class A and class B sludges, therefore, once again, CLF not only supports Senator Wheeler's amendment which calls for the prohibition of class B sewage sludge for reclamation , we would further advocate the prohibition of the use of class A sewerage sludge for reclamation purposes. With respect to industrial sludge, CLF is particularly concerned with the potential for dioxins and organic compounds to cause contamination

of groundwater resources. Finally, the rules most recently promulgated by DES, pertaining to sewerage sludge requires that reclamation sites be monitored, that basically, ground water management plan be put in place when sewage sludges are used for reclamation purposes. We feel that this requirement is in acknowledgement of the serious concerns relative to reclamation sites. We also feel that monitoring in this manner basically, allows the contamination to occur and then requires that the contamination be cleaned up. It's our strong position that prohibiting the use of sludge in reclamation gravel pits, will protect New Hampshire's aquifers, it will prevent the contamination from occurring in the first place, and will avoid the cost associated with then remediating any contamination that occurs.

Senator Richard L. Russman, D. 19: Thanks very much for your testimony. The Chair would recognize Henry Veilleux.

Henry Veilleux: Thank you Mr. Chairman, members of the committee. For the record, my name is Henry Veilleux, and I'm here on behalf of Wheelabrator Bio Gro. I passed out a letter from Ann Bosiak, she's a technical services coordinator with Wheelabrator Bio Gro, which goes into detail. [Attachment X].

Senator Richard L. Russman, D. 19: Questions? Thanks very much for your testimony. Chair would recognize Caroline Snyder .

Caroline Snyder: Good afternoon, Chairman Russman, members of the Environment Committee, thank you for the opportunity to testify in support of Senate Bill 218. This is a modest bill it's not a radical bill, but it's very necessary, it's necessary because the current state rules are not protective of human health, of the environment or of long term agricultural productivity. You've heard Mr. Currier testify earlier today that he plans to put together a panel of experts to advise DES. DES has had a chance to do that now for two years. They have had a technical advisory committee that's dominated by the industry. They have, however, had a tremendous amount of input from experts in this field . We have provided them over fifty peer viewed recent articles and a lot of data and they seem to have ignored these experts. They have ignored recent data and sound science, they've ignored EPA guidelines how to protect potable groundwater, they've ignored EPA guidelines on the data of the hazards of dioxins they've ignored the advice of their own UNH scientists, they've ignored northeast guidelines for land application, they

exist. They are beautifully spelled out written in wonderful English. They could be used but they're being ignored by DES. They're also ignoring the recent findings and warnings about arsenic in drinking water, and they're even ignoring the recommendations of New Hampshire Bureau of Health, it's assessment on metal limits. The New Hampshire Bureau of Health Risk Assesment, recommends the same metal limits that this bill, 218 recommends. They are in the 99th percentile of New Hampshire sludge, which means 99% of New Hampshire sludge could meet it and only one percent could not. Sludge is very very difficult to regulate, because it's not a uniform product, it differs from batch to batch. One week you can have a batch that meets the northeast guidelines and the next week you can have a batch from the same treatment plant that is so contaminated that it has to be qualified as hazardous waste. The farmer never knows what he's getting. Ideally, every load has to be tested, not only for the nine heavy metals or the two hundred toxic organics, but for the tens of thousands of other contaminates that are in sludge ... The northeast with it's limited farmland, with it's low quality sludges, with it's high water tables, with it's very acidic and shallow soils, it's the least suitable place for sludge application. If you're going to do it at all, you should do it with extreme caution. This bill, although it will not make sludge spreading safe, it will make it safer, as was said earlier today. DES has provided written testimony against this bill saying that many of the provisions in it are arbitrary restrictions. We do not believe these restrictions arbitrary, we believe that they are based on sound science, and we are very surprised at municipal association that believes that science based rules should govern our sludge land application programs are not supporting this bill, because this bill is based on science whereas the EPA guidelines are outdated based on a flawed risk assessment and the new state rules are very close to that. Because DES has said that these provisions are arbitrary, we are submitting additional supporting material. If you could please pass this out to the Senators, I would appreciate it. I want to quickly, very quickly, go over this material [Attachment Y].

Senator Richard L. Russman, D. 19: Thank you. Question from Senator Cohen.

Senator Burton J. Cohen, D. 24: I was very interested to see this C3, but I don't seem to have C3.

Caroline Snyder: It was sent to you earlier, the sponsors of this bill, four of you, I sent you a package that had the Shane O'Connor description of what happened in Greenland. So, I didn't attach it again, but the other four

Senators were not sponsors of it. But, I can give you a copy, I have an extra copy.

Senator Burton J. Cohen, D. 24: I would like to see it. One further question. Do you happen to know what Vermont is doing? There's a lot of dairy in Vermont. What are they doing in regards to...

Caroline Snyder: Yes. That's another point. I would like to say that this bill makes New Hampshire bills comparable to the other New England states. Vermont, at least, has a six month waiting period, for cattle, for grazing. We only have forty five days. Vermont, we have another person testifying here later who will actually describe the differences between our laws and their state laws, and she will go in great detail, but there are certain aspects in Vermont's laws that are certainly more protective than our current laws. In fact, this bill, we actually look at the New England laws and try to pick out the best features. The most protective features in Maine, Vermont, Massachusetts and well, from those.

Senator Richard L. Russman, D. 19: Further Questions? Thank you very much for your testimony. The Chair would recognize Sheilagh Connely.

Sheilagh Connelly I am today going to be representing the organization called the New Hampshire Water Pollution Control Association which I'm a member of the biosolids committee. We would urge the committee to vote inexpedient to legislate [See attachment Z]

Senator Richard L. Russman, D. 19: Question? Yes Senator Cohen.

Senator Burton J. Cohen, D. 24: Just a quick question. Early on you testimony you mentioned some products that you could by at Home Depot and places like that. Could you tell me the names of those I want to make sure that I never buy them.

Sheilagh Connelly: Melorganite. There's actually a few more that you can.. make sure that when you buy something you ask them, specifically what's in it. It will be on the label as well if you don't want to have it.

Senator Richard L. Russman, D. 19: Senator Below.

Senator Clifton Below, D. 5: Thank you. A couple of questions. One, do you happen to know how with the heavy metal content of commercial fertilizers is compared to sludge.

Sheilagh Connelly: It varies. There are some commercial fertilizers that have less amounts, there are some pig manure that have higher amounts. An area that I always find interesting is raw phosphate, its typically mined out of Florida, has higher cadmium than you'll find in any biosolids generated anywhere in New England, and that's a certifiable organic farming material. It really ranges. One of the biggest differences that I look at is really that bio-solids is really the most researched and the most regulated material out there, and the practices that go into it and the testing that has to be done to insure proper agronomic loading rates and tracking and setbacks. It goes well beyond any commercial fertilizer that manure management that folks will ever get. Without a doubt.

Senator Clifton Below, D. 5: Are you suggesting it's conceivable that in some instances if a farmer switched commercial fertilizers with some toxins or some heavy metals they may actually end up depositing more than if they were using sludge.

Sheilagh Connelly: It's a possibility. I would just point out to you along that theme. Tadmore farm up in your district, Mike Townsend testified here last time, his farm does a mix of manure and biosolids, and they've been using it for five or six years, and that's the sight of the UNH research project. Their farm has actually cleaned up the surrounding water quality by following the bio-solids regulations and best management practices, and they've extended those practices and that soil testing and those nitrate loadings to their manure management based on what they've seen in terms of results in terms by using the biosolids. Right now, there's a huge initiative out at USDA and EPA on water quality for Chesapeake bay Region, Chaplain, all the major great lakes that have become depositories from run off from agriculture, and they are now looking towards the biosolids industry and users to show them techniques and ways to clean up the water quality based on what we've been doing for the last twenty years.

Senator Clifton Below, D. 5: One more question. Do you have the list of municipalities in New Hampshire that produce class A vs. class B. I think somebody's given us the list of those that do class B.

Sheilagh Connelly: I can get it for you. ...to finding a solution if this isn't the one we're comfortable with at least then people know we've got to do something.

Senator Richard L. Russman, D. 19: Thanks very much for your testimony. The Chair would recognize Chris Rueggerberg.

Chris Rueggerberg: Good afternoon, my name is Chris Ruebberberg and for the record, I am representing the Sierra Club and we support the passage of Senate Bill 218 with the proposed amendment by Senator Wheeler. [AttachmentAA]

GAP IN TAPE... Change TO TAPE THREE

Testimony of Dan Holmes already in progress [See Written Testimony Attachment DD].

Senator Richard L. Russman, D. 19: Any questions? Thank you for your testimony. Chair would recognize Ralph Kirshner from Center Harbor[Attachment FF].

Ralph Kirshner: Thank you Mr. Chairman, as most of you are aware, I'm a Resident of Middlebury Island on Lake Winnipesaukee which is technically in the town of Tuftonborough, and I drink water out of the lake so I'm not concerned with the water quality, and a lot of the testimony today seems to be on fairly technical grounds of percentages and parts per million and so forth. That makes very little difference to the people who drink the water. They want to know whether it's a health risk to them or not. They also want to know what it going to cost them to clean up the water if it is a health risk, and then it becomes a question of who pays. Do I pay or does the paper industry and waste industry pay. Now obviously they can recover it from their user fees. I can't. I'm very well aware of what happens when I flush my toilet. I check my system frequently. More often than annually. I've had to have my septic tank pumped once in thirty years, and that was when I had

the tank replaced because it was rusting out, and I assure you nothing went into that tank that shouldn't have. Unfortunately, that's not the case for most people, particularly in urban areas, particularly in areas like Lowell where we're taking the sludge, and even more particularly in areas like New York City which is now shipping sludge by the trainload to Texas. New Hampshire's an awful lot closer than Texas. Who knows what's going in this stuff, I don't. Unfortunately, in New Hampshire, the agency responsible for regulating sludge is also a major producer of sludge. DES runs the Winnipesaukee river basin plant in Franklin, which is one of the plants that has been mentioned as not being updated to produce class A sludge yet. When we put producer in charge of regulating, there's a built in conflict of interest, and that conflict, unfortunately, was created by this legislature and therefore it's up to the legislature to resolve it , otherwise, we're in the situation of putting Exxon in charge of tanker safety or why don't we go to the state prison and have the inmates be in charge of the rules for enforcing the criminal code. When they have the conflict of interest the legislature has to take over. I'm going to repeat everything that you said previously, I would like to point out that existing law is far more stringent than this bill, if existing law were enforced by DES. RSA45;17 concerning pollution, says that anybody putting anything in or near a lake, pond, reservoir or stream tributary thereto that may cause such water to become impure or unfit, is committing a crime. Basically, if that law were enforced, any application of sludge anywhere near a stream, anywhere in this state would be illegal. That covers just about the whole state. We also have a law, which is RSA 155E concerning gravel pits and reclamation which says that except for exposed rock ledge, all areas which have been affected by the excavation shall be spread with topsoil or strippings. Sludge is not topsoil or strippings. RSA 155E;5 were enforced, there would be no spreading of sludge or paper mill waste on gravel pits because it's not soil or strippings. Unfortunately, we don't have the enforcement of existing law that we should have, and we're left with two alternatives. One is to enforce that law. The other is Senate Bill 218.I will leave you with that. I will leave you with a copy of my written testimony, which you may have gotten back in March when I couldn't attend, and I'll be glad to answer any questions.

Senator Richard L. Russman, D. 19: Thanks very much, questions? Thanks very much. Did you want to speak Jim Ruebens.

Jim Ruebens: Thank you Mr. Chairman My name is Jim Ruebens from Hanover representing Think New Hampshire we're an organization which is largely Republican in makeup and we've taken a position in opposition to New Hampshire's excessively lenient sludge spreading legislation, however,

personally, I'm not qualified nor are we, to endorse or oppose each and every word of the bill, some of it is technical but clearly we're here in support of sludge regulations that are more directed at conservative limits, science based conservative limits to application rates than the limits that are now in place. Generally, I'm loathed to recognize any action by legislature to micro-manage regulatory apparatus in this case very technical, but in this case, the department of environmental services has been pointed out as a duel role of both promoting and regulating the application of sludge and the organization has become captured by the industry it regulates and is therefore not protecting the public health and safety at this point. Industry capture. That as prior person giving testimony pointed out, requires the legislature to step in. The issue here is, in conclusion, pretty simple, we're talking about, in general, saving twenty, thirty bucks a ton for example, Springfield and Lowell Massachusetts so they can spread sludge in New Hampshire. That's what the issue comes down to. We're balancing that. Yes, there would be an increased cost to Lowell and Springfield, Mass. if they could not split and spread some of those materials here. We are balancing that off against the need to prudently protect public safety. If this issue were, for example, the way we regulate prescription drugs, they must be proven safe and effective prior to their being allowed to be ingested into the human body. This is very similar because sludge contains materials we know to be toxic like live virus, dioxins, radioactivity, heavy metals, and their clearly established pathways into the human body through food and water, particularly on agricultural land and near water tables as the bill addresses the issue of very proximate spreading of industrial sludge to water tables and reclamation land. It would, therefore, in a very parallel basis require the legislature to exercise the same kind of prudence in the management requirements for sludge. If it can get into the human body, it's known to be harmful then exercise scientific caution. So the legislature needs to step in because of the fact the industry has captured the regulatory apparatus in the state and by default, you folks need to protect the public health and safety in our state, thank you very much.

Senator Burton J. Cohen, D. 24: Any Questions? Senator Johnson. Thank you .

Senator Carl R. Johnson, D. 3: Senator Reubens, so are you saying that the current regulations that DES has are not scientifically supportable?

Jim Reubens: No, on the basis of, for example, Springfield Massachusetts, sludge containing radioactivity and on the basis of the test frequency not being sufficient for those people on whose land this material is being spread

in New Hampshire. To know the extent to which human health and safety is being impacted, absolutely not. The dioxin issue has been discussed. I don't need to rerehearse that. The more we learn about it the more we learn that we should be minimizing, perhaps at a very aggressive degree, minimizing the extent to which this material is brought back in greater quantities into the human food chain, through application on agricultural grazing land. It may make no sense whatsoever to put any of it on such land or on water tables on reclaimed gravel pits. Again, arguing that we exercise scientific conservatism because these materials have clear pathways are known to be toxic into the human body.

Senator Burton J. Cohen, D. 24: How well could that, the DES requirements counteract ... twenty five feet, spreading from water by .....

Jim Ruebens: I'm not qualified to make a statement on that .

Senator Richard L. Russman, D. 19: Further Questions? O.k., thank you. Is there anybody else that wants to speak on...

Chip Chesley: Thank you. You've had a long day, I'll keep my comments short. My name is Chip Chesley. I'm the public works director for the community of Merrimack New Hampshire. We are a community that's had a long standing commitment to clean water. We were the first community in New Hampshire to build a secondary waste water treatment plant thirty years ago. On our twenty fifth anniversary, we received an award for United States EPA's best operated and maintained facility in the country and we compete with sixteen hundred other plants in the country. I think that's a noble award. The following year we won an award from the American Society of Civil Engineers for our composting plant which I'll speak to later, and just received a nomination for our pretreatment program from U.S EPA. So, in brief, I think our efforts at clean water are notable, but we also have the experience of thirty years behind us in producing the material that we're discussing today called sludge. And we basically looked at and tried every method possible. Initially, when our plant operated, we were so happy with the plant we kind of ignored what's going on in the back end of the plant but we soon realized that we had to do something with that material. We began to bury it. It was soon realized, in Merrimack, that we didn't have a balanced horizon, that there were limits that we could not fill every hollow in Merrimack with a product . And then we spent millions of federal dollars, millions of state dollars and some of our own dollars to build an incinerator. I

guess a technology in incineration is, if you have a problem lets use a nonavailable resource such as fuel oil and burn it make that problem smaller. It reduces the volume by 90%. Extends the volume of landfilling. We tried that for a while and then we recognized that the product we're producing, has benefit. We can live in a sustainable economy. Then we started a compost and in this instance, we spent millions of local dollars, a million of state dollars and no federal dollars to build that facility and we built a class a composting facility. We find ourselves somewhat paradox in that about 80-85% of the material that we produce, is marketed outside of the state. Apparently we get better revenue for our products than New York State, Connecticut, Massachusetts, and Rhode Island, than we do in New Hampshire. So, hence, we market there. So that very little of our product is actually distribute in New Hampshire. About 20% of it. But, given that, though we do market in New Hampshire, this bill would have an impact to our operations. Now, I've heard some testimony today that it takes DES to tax. ... there's been times when I've taken DES to tax and I can understand that. But there is something in our New Hampshire Constitution that says if the legislature is going to step in and come with the New Hampshire difference we have the federal difference here, we have the New Hampshire difference up there and I don't think anyone disagrees with that to play to a higher standard. The New Hampshire legislature also has a financial obligation to pick up that tab. So, I think that's one thing that as we discuss this issue, we have to look at that tab and where it's going to go. And I was encouraged to hear discussions Previously about funding, about having class B operations come to class A, and I would hope that that funding is retroactive 'cause Merrimack already made that expenditure in 1994. Merrimack isn't in the business of handling sludge by itself. We also take about forty percent of the material that Nashua handles right now, all the material that Henniker produces, all the material that Durham produces. We also receive material from an airforce tracking station in New Boston. So this really isn't just a Merrimack issue, I think I'm speaking with some concerns with some of the other communities that share our facility with us. In brief, I would recommend to this group that you've heard an awful lot of testimony, a lot of it had TPT, PKM, long list of names next to it. It is a very complex subject. One that I'm the guy at the .... Plant that's made it a profession to study what happens when you flush. You don't care about it, but I do. It's a very complex topic. I would encourage this committee to study this much further before you take any action on that because one, it has tremendous financial implications. We've just gone through a very tough challenge in this body to come up with the education issue. I think we've got to study what it is that we're dealing with because there is a cost to come up with the New Hampshire Difference and the second issue is will we make that decision. It should be an educated discussion and you folks should have the benefit and the time to consider all the issues that you've heard by all the folks behind me, cause there's a broad range of issues

here and it's not something that I would think if I were in your shoes I would want to make that decision instantaneously and bring it to the full floor of the Senate.

Senator Richard L. Russman, D. 19: Questions? Thanks very much for your testimony.

Senator Carl R. Johnson, D. 3: Have we reached a level of violating 28-A yet?

Chip Chesley: I think if this bill passes, I would advise my selectman that the town of Merrimack is going to incur additional costs to the passage of this bill. I would also so advise my selectman to advise those bodies of the other communities that we serve.

Senator Richard L. Russman, D. 19: Is there anybody else that feels compelled to testify on Senate Bill 218? O.K., we'll close the hearing.

HEARING CLOSED

*Respectfully Submitted,*

*Anna-Maria Tsorvas*
*Committee Secretary*

Attachment A

# The Senate of the State of New Hampshire

107 N. Main Street, Room 302, Concord, N.H. 03301-4951

KATHERINE WELLS WHEELER
Vice President - Operations
District 21

Office 271-2111

TTY/TDD
1-800-735-2964

Chairman Russman and members of this committee, thank you for the opportunity to speak before you today in support of Senate Bill 218 as amended. SB 218 has been introduced in response to the new sludge rules adopted this month by the Department of Environmental Services (DES).

The purpose of SB 218 is to legislatively provide the management, testing, sludge quality standards, and land application standards that will protect New Hampshire's agricultural resources, water resources, wildlife, and the health of its citizens. As amended, SB 218 focuses on the regulation of Class B sewage sludge, which is lower in quality than Class A. The new sludge rules ignore many of these environmental concerns.

## WHY THIS BILL IS NECESSARY

The *Harper Collins Dictionary of Environmental Science* defines sludge as a " viscous, semisolid mixture of bacteria- and virus-laden organic matter, toxic metals, synthetic organic chemicals, and settled solids removed from domestic and industrial waste water at a sewage treatment plant." Please see the sewage sludge question and answer sheet.

As a regulator, the Department of Environmental Services should take a cautionary approach. to the way a substance with this definition is used in New Hampshire. Instead, the new sludge rules adopted by DES are designed to make the use of sewage sludge as easy as possible. They favor industry needs and the overall goal of DES- to encourage the use of sludge rather than to make its use as safe as possible.

The important issue to remember in this debate is that DES is basing its new state rules on federal regulations that are scientifically unsound. Please see the "EPA Sludge Magic" sheet you received in the mail from Dr. Snyder.

## THE BASIS FOR THIS LEGISLATION

The recommendations in SB 218 are based on peer reviewed scientific evidence. Dr. Snyder has provided you with the scientific citations that support the language in the bill. She will also explain the specific provisions of the bill.

The prohibition in section 2 of the bill against using Class B sewage sludge and industrial paper mill sludge to reclaim spent gravel pits located over aquifers was also recommended by DES during the rulemaking process. This recommendation was abandoned due to industry pressure.

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The maximum metal concentrations in section 3 of the bill that must be requires by waste water treatment facilities on January 1, 2001 were also recommended by DES during the rulemaking process. Under pressure from the business community, compliance with these standards that would result in cleaner sludge is now voluntary on the part of industry.

The bill also relies on language in the old sludge rules that in many cases was more restrictive than the new sludge rules. It is important from a regulatory standpoint that the regulated community follow the nonpartisan University of New Hampshire best management practices for land application. This legislative requirement negates the new rule that the regulated users of sludge may use their own best management practices.

**FALLACIES IN THE FISCAL IMPACT STATEMENT**

SB 218 does not require landfilling as the only option for sludge disposal. The fiscal note for SB 218 does not specify how, on a community-by-community basis, this bill will eliminate the land application of Class B sewage sludge. The current focus on sludge use is for agricultural applications, which this bill regulates. Municipalities should look at new and safer uses for sludge that keep it out of our food chain.

The University of New Hampshire Cooperative Extension recommends that in order of priority sewage sludge first be applied to non- agricultural land. Municipalities have numerous options for using sludge that are certainly not prohibited by this bill, and that are recommended by UNH.

Non- cropland uses include capping landfills and roadside restoration. Non- food crop uses include turf for ski slopes, athletic field renovations, and landscape sites. Non- food crop uses also include nurseries for deciduous trees and shrubs.

The fiscal impact statement should not include increased costs for meeting new metal concentration limits. Dr. George Estes, who has worked on UNH's best management practices, has consistently argued that New Hampshire produces sludge that is low in metals. Assuming this is true, industries will have no trouble meeting the new maximum metal concentrations in the bill, and the sludge will not have to be landfilled.

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If the sludge from out-of-state facilities cannot meet the low metal requirements in SB 218, there is no reason for requiring New Hampshire municipalities to continue importing sludge and then having to pay for its landfilling- while the sludge haulers continue to make a profit. New Hampshire can rely on public health and safety concerns to prohibit the importation of low-quality out-of-state sludge. In fact, a federal court has upheld the authority of Rappahannock County in Virginia to ban out-of-state sludge for just these reasons.

As amended, SB 218 deals with many DES concerns. A new fiscal note should be prepared with a lower and more realistic fiscal impact.

SB 218 Attachment B

**State of New Hampshire**
**DEPARTMENT OF ENVIRONMENTAL SERVICES**
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603) 271-3503 FAX (603) 271-2982

March 25, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Rm 102
Concord, NH 03301

**Re:** ***SB 218, regulating the land application of sewage sludge***

Dear Chairman Russman:

The Department of Environmental Services (DES) wishes to thank the Committee for the opportunity to comment on SB 218 which would institute a number of specific requirements pertaining to the land application of sludge. The Department does not support this legislation.

In part, SB 218 proposes to write into law some permitting requirements and stringent technical standards on issues, such as sludge quality and setback distances, which were discussed at length during the recent DES sludge rulemaking process. Virtually all of these issues were considered and addressed in the proposed rules, although the outcomes are somewhat different. We believe that the proposed rules are sufficiently protective of public health and the environment, and we are committed to continue our work to improve them. We would be happy to provide the Committee with a presentation on these proposed rules and the ongoing rulemaking process at your convenience to provide you with more details on these efforts.

The attached table, developed by DES staff, provides a detailed comparison of the proposed provisions of SB 218 and Env-Ws 800. Where appropriate, we have also described the effect of SB 218 on the sludge program and detailed technical concerns with this bill. Several major issues and the DES sludge rulemaking process are described further below for your consideration.

First, we are concerned that some of the language in SB 218 is subject to broad interpretation or impractical, and, consequently, is either not implementable or subject to future challenge. For example, in the proposed RSA 485-A:5-f, Sludge Containing Dioxins, "containing dioxins" is ambiguous. "Sludge containing" is not a quantitative standard but a test with two possible conclusions: "containing" or "not containing". All laboratory analyses are performed to a detection limit below which the contaminant of concern can not be detected by the particular analytical technique used, even if it is present (which may or may not be the case). The scientific community could conclude that the intent of this bill is that 'not containing" means that a contaminant is "not present above laboratory detection limits". Another interpretation is that sludge can contain absolutely no dioxins, which is impossible to prove. If this is the intent then this provision in itself results in a ban on sludge land application.

DES does not support the proposed maximum holding time of 30 days in the proposed RSA 485-A:5-d,VIII. The 30-day holding time for land application sites, and potentially for sites with facilities (since "site" is undefined in the bill), makes sludge land application infeasible because many applications occur only once per year per field, frequently in the spring. For these situations, stockpiling, in accordance with criteria contained in DES regulations, is required over the winter to be prepared for the spring application in order to accumulate adequate quantities of sludge.

DES does not support a prohibition on municipal wastewater treatment plants from excluding towns that stringently regulate sludge disposal within their borders from delivering septage to the treatment plant. Most treatment plants were designed and built to meet the specific needs of the immediate community and a few to serve regional needs. Several of the larger facilities, such as Manchester and Concord, currently have excess wastewater treatment capacity which allows them to accept septage from area communities. Nevertheless, the main responsibility of wastewater treatment plant owners is to treat and discharge properly treated wastewater under specified limits outlined in a joint state/federal discharge permit. In general, they are not responsible for handling septage beyond their service area. In fact, this is specifically addressed in RSA 486:13, Disposal of Septage "... municipalities shall not be required to receive and treat septage in such amount or at such times as would interfere with proper operation of municipal treatment and disposal facilities." Wastewater plants that do accept septage and sludge from other communities, and can physically do so without interfering with plant operation or violating any regulatory permits, should be encouraged to do so. But they should not be forced to take these materials, when inconsistent with plant capabilities, municipal policies or federal permit requirements.

The proposed 250-foot setback from all surface waters also is inconsistent with the standards set in the rulemaking process. On the other hand, the proposed setback is partially consistent with 1998 legislation which established a 250-foot buffer for designated rivers and requires immediate incorporation of sludge for sites with a designated river corridor. In the Sludge Management Rules, a buffer of 125 feet from a permitted sludge application area to surface water is required, unless the sludge is incorporated within 48 hours, in which case the buffer distance is 75 feet. The purpose of the buffer is to minimize surface water impacts from sediment or nutrients in field runoff. With the sludge quality and testing requirements in the Sludge Management Rules, there is virtually no potential for other surface water impacts over and above those common to agricultural tillage practices. Best Management Practices (BMPs) published by the New Hampshire Department of Agriculture Markets & Food specify 20 feet as a minimum buffer, so it is apparent that the buffer requirements of the sludge rules far exceed minimum BMP requirements. Although it is generally true that greater buffer distances provide greater protection, there is no perceptible incremental protection to surface water by increasing the buffer distance to 250 feet. In fact, other factors such as the vegetation and management of activities within the buffer have far greater protective influence than distance.

As part of the 1998 sludge rulemaking process, DES undertook one of the most resource intensive efforts that has occurred over the past decade to receive and consider public input. This was a proactive effort aimed at maximizing common understanding and consensus. Meetings were held with municipal officials, environmental groups, the Business and Industry Association, a subcommittee of the Water Council, and members of the House Environment and Agriculture Committee. Two formal

pubic hearings were held, and we extended the comment period to ensure that all input and information could be properly considered. Proposed rules, proposed changes to proposed rules (based on public comment and meetings), and summaries of public comments were all placed on the Internet to ensure all interested parties had as much information as possible in a timely manner. As a result, we believe that DES succeeded in developing rules which can be considered fairly reasonable considering the diverse and highly polarized viewpoints on this difficult issue. We expect these rules to be in effect within the next several days.

Nonetheless, the sludge rules are still a work in progress. We have committed to a second phase of rulemaking, which will begin this Spring, to address some issues which were deferred during the 1998 effort. This will allow time for further discussion and hopefully reaching consensus wherever possible. Among the issues to be addressed are: establishment of long term incentives to improve overall sludge quality; development of a sludge category system to regulate and manage sludge according to its chemical constituents, pathogen reduction process, and stability characteristics; and exploration of detailed risk-based chemical standards for additional contaminants which fully consider exposure scenarios specific to sludge. These revisions will further our efforts to improve the regulation of sludge land application in New Hampshire, consistent with the intent of SB 218.

Finally, if SB 195-FN, which passed out of this Committee last week, is adopted, DES will conduct an extensive sampling program of sludge from New Hampshire wastewater facilities in 1999. This survey should answer many of the questions which have been raised concerning the quality of New Hampshire's sludge, the underlying concern which SB 218 seeks to address.

In conclusion, if SB 218 is passed, the cumulative effects of the proposed requirements will essentially be a ban on the land application of sludge, which does not appear to be the legislative intent. Consequently, we recommend that you to vote SB 218 inexpedient to legislate.

Thank you for your consideration. If you have any questions, please contact me at 271-3503 or Paul Currier at 271-2457.

Sincerely,

Robert W. Varney
Commissioner

Attachment
cc: Senator Katherine Wheeler
Senator Burton Cohen
Senator Richard Russman
Senator George Disnard
Senator Lou D'Allesandro
Representative Betty Hall
Representative Derek Owen
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**SENATE BILL 218 - COMPARISON WITH SLUDGE RULES, AND SUMMARY OF TECHNICAL ISSUES**

| Para | Provision of SB 218 | Provision of Env-Ws 800 | Effect of SB 218 | Technical Issues |
|---|---|---|---|---|
| 1) 485-A: 5-c IV. | Requires personal, written notification to all owners and occupants within 200' of a land application site. | Prohibits class B land application within 200' of occupied buildings, or 500' for top dressing. | **Essentially eliminates use of class A compost for landscaping.**<br><br>No effect at permitted class B sites. | 1) Personal, written notification for all occupants is not feasible<br>2) No provision for administration or enforcement, (DES does not issue permits for class A land application sites) |
| 1) 485-A: 5-c VI. | Registry of deeds recordation for "not low metals" sludge land application sites | No recordation requirement. | Requires deed recordation at all sites where either class B sludge or compost is applied. **Essentially eliminates use of class A compost for landscaping.** Deterrent to class B agricultural use. | 1) "low metals" not defined (the definition in rule will be modified in future rulemaking)<br>2) Facility not defined, but appears to conflict with rules<br>3) Recordation of analysis lab sheets not feasible<br>4) No elevated risk from metals at land application sites |
| 2) 485-A: 5-d II. | 10 ppm molybdenum for grazing land or forage crops | 35 mg/kg molybdenum. | Eliminates about 30% of NH sludges for use on grazing land or forage crops. Deterrent to class B agricultural use. | Arbitrary restriction. No elevated risk to cattle from molybdenum at 35 mg/kg. |
| 2) 485-A: 5-d III. | Prohibits sludge application on forest or newly clear-cut land. | Allows sludge application on forest land at agronomic rates, with permit. | No effect - sludge is not presently applied to forest land in NH. | Arbitrary restriction. |

| Para | Provision of SB 218 | Provision of Env-Ws 800 | Effect of SB 218 | Technical Issues |
|---|---|---|---|---|
| 2) 485-A: 5-d IV. | Prohibits solid waste or hazardous waste disposal as sludge. | Prohibits solid waste or hazardous waste disposal at sludge sites and facilities, except for wood ash and waste-derived products | **Eliminates beneficial use of wood ash with sludge.** May eliminate co-composting of sludge and yard or food wastes, which may be considered as solid wastes. | Arbitrary restriction on beneficial use of waste-derived products and composted materials |
| 2) 485-A: 5-d V. | Maintenance of soil pH between 6.5 and 7.0 for 5 years for all sludge application sites | No pH maintenance requirement. | Arbitrary requirement. **Essentially eliminates use of class A compost for landscaping due to excessive burden on owners.** Added monitoring requirement for class B agricultural use. | 1) Arbitrary requirement - literature review and DES experience show very low mobility of metals in NH soils with no pH management<br>2) Unenforceable for compost |
| 2) 485-A: 5-d VI. | 250' buffer between land application and surface water` | 125' buffer between land application and surface water | **Significant limitation on agricultural land area for land application.** | Arbitrary restriction |
| 2) 485-A: 5-d VII. | 3' minimum distance to bedrock | 2' minimum distance to bedrock or restrictive layer | Little effect | None |
| 2) 485-A: 5-d VIII. | No stockpiling in floodplains, or for greater than 30 days, or where less than 4' to max water table . | No stockpiling >48 hours in floodplains, or >8 months, except at a facility, or less than 2' to max water table. | 30 day stockpiling time limit at both sites and facilities **essentially eliminates land application of sludge and compost.** | Arbitrary requirements |
| 2) 485-A: 5-d IX. | No land application on slopes >8%. | Sludge applied to agricultural land on slopes >8% must be >15% solids or subsurface injected. | Eliminates some agricultural land from sludge application. | Arbitrary requirement |

| Para | Provision of SB 218 | Provision of Env-Ws 800 | Effect of SB 218 | Technical Issues |
|---|---|---|---|---|
| 3) 485-A: 5-e I. | POTWs which land apply sludge must list industrial contributors and wastewater constituents. | SQC applicants which are POTWs must submit a list of industrial permittees, with their wastewater constituents. | Essentially duplicates provisions in rule. | 1) Where list is to be maintained is not specified. 2) Relation to POTW discharge permit provisions is not specified. |
| 3) 485-A: 5-e II. | Metals limits, including"low metals"are incorporated into statute as of 1/1/2001 | Metals limits, including "low metals" are already in the rules. | Eliminates flexibility to set risk-based standards in rule, and to develop incentives in rule for cleaner sludge. | 1) "low metals" not defined 2) Negates DES initiative to develop generator incentives for cleaner sludge |
| 3) 485-A: 5-e II.(12) | Dioxin limits at 10 ng/kg:27ng/kg | Dioxin limits at 10 ng/kg:27ng/kg. | Duplicates values in rule, and eliminates future flexibility to set risk-based standards by rule. | Prevents continued BHRA and DES development of risk-based dioxin standards |
| 3) 485-A: 5-e III. | Annual testing of sludge from water treatment facilities with SQC | At least annual testing of sludge for all SQC holders | Essentially duplicates provisions in rule. No effect - no water treatment facilities (only wastewater facilities) hold or have applied for SQCs. | Sludge Quality Certification not defined. |
| 3) 485-A: 5-e IV. | SQCs expire 2 years from date of issuance | SQCs expire 5 years from date of issuance | Significant disincentive to land application. Essentially requires 4 full rounds of samples each year from SQC holders - cost prohibitive at about $7,500 increase/year. Significant deterrent to land application. | 1) Sludge quality certification not defined 2) Excessive testing requirements |
| 3) 485-A: 5-e V. | Requires adherence to UNH BMPs for agronomic application rates | Requires adherence to UNH BMPs for agronomic application rates unless mixture/site specific data are available. | Minimal effect. Eliminates discretion to use site-specific information | UNH Cooperative extension does not maintain BMPs for all situations |

| Para | Provision of SB 218 | Provision of Env-Ws 800 | Effect of SB 218 | Technical Issues |
|---|---|---|---|---|
| 3) 485-A: 5-f I. | 12 month grazing restriction after sludge application | 45 day grazing restriction after sludge application | Arbitrarily eliminates field use for grazing for a full season. | Arbitrary restriction. |
| 3) 485-A: 5-f II. | Prohibits food crop production on land to which sludge containing PCDDs and PCDFs has been applied. | EPA 40CFR503 restrictions on food crops grown after sludge application. | Minimal effect-Sludge is not used for food crops in NH. | 1) PCDDs and PCDFs are not defined<br>2) No threshold limit is specified |
| 3) 485-A: 5-f III. | Prohibits pasturing livestock for human consumption on land to which sludge containing PCDDs and PCDFs has been applied. | 45 day grazing restriction after sludge application. | Arbitrarily eliminates field use for livestock for human consumption forever. | 1) PCDDs and PCDFs are not defined<br>2) No threshold limit is specified |
| 3) 485-A: 5-f IV. | Notification and use restriction to subsequent landowners for land to which sludge containing PCDDs and PCDFs has been applied. | No specific requirements for dioxins, above site permit requirements. | Arbitrary burden to subsequent landowners. All sludge can be presumed to contain traces of PCDDs and PCDFs. | Unenforceable |
| 3) 485-A: 5-f V. | Signed statement by owner or operator for sludge containing PCDDs and PCDFs. | No specific requirements for dioxins, above site permit requirements. | Minimal effect. All sludge can be presumed to contain traces of PCDDs and PCDFs. | None |
| 3) 485-A: 5-g I-III. | Requires hauler permits for all sludge transportation, and records for each load of sludge, maintained permanently. | Hauler permits required for class B or raw sludge transportation. Records for each load of sludge are maintained for 5 years after permit expiration. | Arbitrary administrative burden for all sludge transportation, including compost and industrial sludge. | 1) Excessive administrative requirement<br>2) Sludge hauler not defined, but appears to conflict with rule<br>3) Difficult enforcement |
| 3) 485-A: 5-h | Prohibits WWTFs excluding towns from "using its facility" solely because the town has a local ordinance restricting or banning sludge use. | No requirement. | Exacerbates a growing septage management problem in NH. | |

SB 218 ATTACHMENT C

# NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES
## Env-Ws 800
## Sludge Management

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## CHAPTER Env-Ws 800 SLUDGE MANAGEMENT

Statutory Authority: RSA 485-A:4,XVI-b; RSA 485-A:6,X-a

Readopt with amendment Env-Ws 800, effective 3-19-96(doc.#6205), to read as follows:

## PART Env-Ws 801 PURPOSE AND APPLICABILITY

Env-Ws 801.01 Purpose. These rules establish standards, criteria, and procedures for a permit system to manage the removal, transportation, and disposal of sludge in order to protect human health and the environment, prevent nuisances and to encourage beneficial use and recycling of sludge with appropriate performance standards.

Env-Ws 801.02 Applicability.

(a) These rules shall govern:

(1) The processing and storage of sludge;

(2) The land application of sludge; and

(3) The removal and transportation of sludge derived from human waste which is not class A.

(b) Except for the sludge hauling requirements specified in Env-Ws 805, these rules shall not apply to sludge which is disposed as a waste or otherwise used at a solid waste facility permitted by the waste management division of the department pursuant to RSA 149-M.

(c) Except for the sludge hauling requirements specified in Env-Ws 805, these rules shall not apply to sludge which is disposed in an incinerator permitted by the department.

(d) These rules shall not apply to any sludge management activity(ies) incidental to the operation of a wastewater treatment facility for which a surface water or a groundwater discharge permit has been issued by the department pursuant to RSA.485-A:13.

(e) Nothing in these rules shall be construed to modify or lessen the powers conferred upon local authorities by health and land use enabling statutes.

(f) Nothing in these rules shall be construed to eliminate the need to comply with the federal regulations as specified in 40 CFR part 503.

(g) Except for sludge quality certification and labeling requirements specified in Env-Ws 807 and Env-Ws 810, respectively, these rules shall not apply to class A sludge.

Env-Ws 801.03 Co-Disposal of Wastes. Hazardous waste as defined in RSA 147-A or solid waste as defined in RSA 149-M, except for wood ash certified for use under Env-Wm 3400 and waste derived

products certified for use under Env-Wm 3200, shall not be disposed or processed at a site or facility permitted by these rules.

**PART Env-Ws 802 DEFINITIONS**

Env-Ws 802.01 "Abutter" means any person who owns property adjacent to, or across a road, railroad, or stream from the property on which a sludge management activity will be conducted.

Env-Ws 802.02 "Agronomic rate" means the sludge application rate that is designed to:

(a) Provide the amount of nitrogen or other nutrient(s) needed by the crop or vegetation; and

(b) Minimize the amount of nitrogen that passes below the root zone of the crop or the vegetation to the groundwater.

Env-Ws 802.03 "Ambient groundwater quality standards" means "ambient groundwater quality standards" as defined in RSA 485-C:2, I, namely "maximum concentration levels for regulated contaminants in groundwater which result from human operations or activities, as delineated in RSA 485-C:6."

Env-Ws 802.04 "Applicant" means any person who applies to the department for a permit.

Env-Ws 802.05 "Beneficial use" means taking advantage of the nutrient content and/or soil conditioning properties of sludge by supplying agronomic or soil conditioning benefits such as the nitrogen, phosphorus, micronutrients, or organic matter needs for:

(a) A crop;

(b) Forested land; or

(c) Establishing a vegetative cover for reclamation sites.

Env-Ws 802.06 "Class A sludge" means sludge derived from human waste which is class A with respect to pathogens under 40 CFR part 503.32(a) and which meets one of the vector attraction reduction requirements of 40 CFR part 503.33(b)(1) through (b)(8).

Env-Ws 802.07 "Class B sludge" means sludge derived from human waste which is class B with respect to pathogens under 40 CFR part 503.32(b) and which meets one of the vector attraction reduction requirements of 40 CFR part 503.33(b)(1) through (b)(11).

Env-Ws 802.08 "Closure" means the procedures used to cease the use of a facility, or a portion thereof, in a manner that will minimize future risks of environmental damage, and includes all required post-closure inspection, monitoring, and maintenance activities.

Env-Ws 802.09 "CFR" means the code of federal regulations published by the office of the federal register, national archives, and records administration.

Env-Ws 802.10 "Council" means the water council established by RSA 21-O:7.

Env-Ws 802.11 "Department" means the department of environmental services.

Env-Ws 802.12 "Disposal" means the final discharge, deposit, injection, dumping, mixing, spilling, leaking, incinerating, or placing of sludge into or onto any land so that such sludge or any constituent thereof may enter the environment, be emitted into the air or be discharged into any surface water or groundwater. Disposal includes land application.

Env-Ws 802.13 "Facility" means a location or system for storing sludge for longer than 8 months or for the processing, treatment, or disposal of sludge, other than land application. Facilities include, but are not limited to, lagoons, sludge treatment facilities, sludge monofills, sludge transfer stations, and sites where sludge is treated or mixed with other sludge or other material for shipment off site.

Env-Ws 802.14 "Generator" means the person who holds title to the water or wastewater treatment facility that produced the sludge or the facility where sludge is mixed or treated to produce another material.

Env-Ws 802.15 "Governing body" means the board of selectmen in a town, the board of aldermen or council in a city, or town with a town council, or when used to refer to unincorporated towns or unorganized places, or both, the county commissioners.

Env-Ws 802.16 "Hauler" means any person engaged in the removal or transportation of sludge.

Env-Ws 802.17 "In bulk" means a sludge that is distributed in a container of greater than 100 pounds.

Env-Ws 802.18 "Industrial wastewater" means wastewater generated from a commercial or industrial process.

Env-Ws 802.19 "Lagoon" means a pit or excavation designed to receive sludge.

Env-Ws 802.20 "Land application" means the placement of sludge on the ground surface for beneficial use, whether or not the material is incorporated or injected into the soil.

Env-Ws 802.21 "Locally accessible place" means a location, in the town or municipality where the sludge management activity is proposed, that has public access. The term includes the town hall, school building, selectmen's office or the public library.

Env-Ws 802.22 "Management" or "manage" means the practice of supervising, controlling, or undertaking any sludge activity(ies) regulated under these rules, including transporting, land applying, stockpiling, treating or processing.

Env-Ws 802.23 "Operator" means the person responsible for managing the sludge activity(ies) at a site, facility, or wastewater treatment facility.

Env-Ws 802.24 "Owner" means the person who holds title to the land on which sludge is managed or is proposed to be managed.

Env-Ws 802.25 "Permit" means the written document issued by the department which authorizes the holder to manage the site or facility or to use the vehicle to remove and transport sludge according to the terms of the document.

Env-Ws 802.26 "Permit holder" means the person to whom a permit has been issued by the department.

Env-Ws 802.27 "Person" means "person" as defined by RSA 485-A:2,IX, namely "any municipality, governmental subdivision, public or private corporation, individual, partnership, or other entity."

Env-Ws 802.28 "Poorly drained" means a type of soil where water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods. The occurrence of internal free water is shallow or very shallow and common or persistent. Free water is commonly at or near the surface long enough during the growing season so that most mesophytic crops can not be grown, unless the soil is artificially drained. The soil is not continuously wet directly below plow depth. Free water at shallow depth is usually present.

Env-Ws 802.29 "Processing" means any activity to reduce the quantity of sludge or alter its chemical, biological, or physical state. Processing does not include the alteration of a sludge's chemical, biological, or physical state solely for the purpose of odor control.

Env-Ws 802.30 "Publicly owned treatment works (POTW)" means a wastewater treatment facility which is owned by a municipality or other governmental agency or subdivision.

Env-Ws 802.31 "Reclamation" means the addition of organic matter and nutrients to improve and/or promote establishment of vegetation on soils which have been severely disturbed or which are in a poor vegetative state.

Env-Ws 802.32 "Site" means contiguous land areas owned by the same person(s), on which sludge is stockpiled for 8 months or less or land applied, even if the land area is divided by a highway, railroad bed, water body, or boundary of a political subdivision.

Env-Ws 802.33 "Sludge" means "sludge" as defined by RSA 485-A:2,XI-a, namely "the solid or semisolid material produced by water and wastewater treatment processes, excluding domestic septage; provided, however, sludge which is disposed at solid waste facilities permitted by the department shall be considered solid waste and regulated under RSA 149-M." Sludge also includes industrial sludge and sludge mixed with another sludge or another material.

Env-Ws 802.34 "Sludge derived from human waste" means sludge produced by the treatment

of wastewater which contains human fecal material. Sludge is considered to be derived from human waste if any portion of the influent wastewater contains human fecal material.

Env-Ws 802.35 "Stockpiling" means the storage of sludge.

Env-Ws 802.36 "Surface water" means "surface waters of the state" as defined by RSA 485-A:2, XIV, namely "streams, lakes, ponds and tidal waters within the jurisdiction of the state, including all streams, lakes, or ponds bordering on the state, marshes, water courses and other bodies of water, natural or artificial." Surface water includes wetlands, but does not include non-tidal drainage ditches which were designed, built, and used to convey wastewater or stormwater. It also does not include constructed wetlands, lagoons, and other treatment systems designed and built solely as wastewater or stormwater treatment systems provided such facilities were not initially constructed in waters of the state or were not constructed to serve other mitigation purposes.

Env-Ws 802.37 "Transfer" means:

(a) The conveyance of a fee simple interest in real estate; or

(b) A change in the ownership or operational control of a person holding a permit, or a change in an individual holding a permit as follows:

(1) For a partnership, a change in the majority of general partners;

(2) For a corporation, the conveyance of all corporate assets or of a majority of voting shares to a new person;

(3) For other organizations, a transfer of the control of the organization to a new person; and

(4) For an individual, transfer of control to another person.

Env-Ws 802.38 "Vector" means a carrier that is capable of transmitting a pathogen from one organism to another, including but not limited to flies and other insects, rodents, birds, and other vermin.

Env-Ws 802.39 "Very poorly drained" means a type of soil where water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season. The occurrence of internal free water is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. If rainfall is high or nearly continuous, slope gradients can be greater.

Env-Ws 802.40 "Wastewater treatment facility" means a group of devices provided for:

(a) The treatment of domestic or industrial wastewater, or both;

(b) The dewatering of sludge removed from such wastewater;

(c) The treatment of septage; or

(d) Any combination of (a) through (c) above.

## PART Env-Ws 803 REQUIREMENTS FOR NOTIFICATION

Env-Ws 803.01 Notification Requirements for Site and Facility Permits.

(a) The applicant shall provide notice in accordance with this section upon filing an application with the department for a site or facility permit.

(b) The notice shall be provided to:

(1) The governing body of the municipality in which the proposed site or facility is located and the governing body of any adjacent municipality in which an abutter is located;

(2) All abutters to the proposed site or facility as such abutters and their respective legal mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c);

(3) All other landowners within 500 feet of the area on which the activity will occur as such landowners and their respective mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c); and

(4) The department.

(c) The notice shall be:

(1) In writing; and

(2) Delivered by one of the following methods:

a. Sent by certified mail, return receipt requested;

b. Delivered by hand, in which case a signed acknowledgment from the recipient that the notice was received shall be obtained; or

c. Sent by first class mail, in which case a certificate of mailing shall be obtained from the United States post office at which the notices were mailed.

(d) The notice shall contain the following information:

(1) A statement that an application for a site or facility permit, as applicable, has been filed and the type of sludge management activity regulated by Env-Ws 800 that is proposed;

(2) Identification of the proposed site or facility, as applicable, including street address and municipality;

(3) The names, addresses, and telephone numbers of:

a. The applicant;

b. The generators of the sludges that will be managed at the site or facility;

c. The operator at the site or facility; and

d. The owner, and the lessee if the land is leased;

(4) The estimated annual quantity of sludge, in wet tons, to be received at the site or facility;

(5) The proposed dates of commencement and cessation of the activity;

(6) The identification of the locally accessible place where the application, and all supporting information as required under Env-Ws 806.01 for site permits, and under Env-Ws 808.01 for facility permits, are available for review; and

(7) A statement that a local public hearing will be advertised by the department in a newspaper of local circulation and that the department shall hold the public hearing once it has deemed an application to be complete.

(e) If a person to whom notice is required to be given cannot be located, fails, or refuses to sign for the certified mail and/or refuses to sign an acknowledgment when the notice is delivered in hand, the person giving the notice shall provide proof to the department that an attempt to deliver the notice was made, which proof shall be in the form of an affidavit, or a copy of the certificate of mailing submitted to the department with the application.

Env-Ws 803.02 Notification Requirements for Land Application.

(a) A person who will be land applying sludge shall provide notice in accordance with this section at least 14 days before the intended date of the first annual land application.

(b) The notice shall be published in a newspaper of general circulation in the municipality where the land application of sludge will occur and shall include the information required in Env-Ws 803.01(d)(1),(2),(3), and (5).

(c) A copy of the notice shall be posted continually at the entrances to the site beginning no later than 3 days prior to the application and ending no earlier than 3 days after application.

## PART Env-Ws 804 REQUIREMENTS FOR PERMITS

Env-Ws 804.01 Sludge Hauler Permits Required.

(a) Except as provided in (b) and (c) below, no person shall transport sludge derived from human waste which is not class A on public roads without first obtaining a sludge hauler permit from the department.

(b) A sludge hauler permit shall not be required for the interstate transportation of sludge which is not generated, processed, transferred, stored, used, or disposed of in New Hampshire.

(c) A sludge hauler permit shall not be required for transporting sludge from a stockpile location at a permitted site to fields at the same site where the sludge is being land applied.

Env-Ws 804.02 Site and Facility Permits Required.

(a) Except as provided in (e) below, no person shall manage sludge at any place which does not have:

(1) A site or facility permit issued in accordance with Env-Ws 800;

(2) A wastewater treatment facility permit issued under RSA 485-A:13; or

(3) A solid waste facility permit issued under RSA 149-M.

(b) Except as provided in (e) below, a site permit shall be required for:

(1) All sludge land application sites;

(2) All sludge mixing sites where the resultant sludge is to be used on site; and

(3) All sludge stockpile sites where sludge will be stockpiled for 8 months or less and where the stockpile location is not on a site permitted by (1) or (2) above.

(c) Except as provided in (d) below, a facility permit shall be required for:

(1) The processing, treatment, or disposal, other than land application, of sludge;

(2) All sludge mixing sites where the resultant sludge is to be used off-site;

(3) All sludge stockpile sites where sludge will be stockpiled for greater than 8 months;

(4) The construction, operation , and closure of sludge lagoons and monofills; and

(5) The construction, operation, and closure of sludge transfer stations.

(d) A facility permit shall not be required for the processing of sludge for the sole purpose of odor control at a site permitted for land application.

(e) Persons who land apply class A sludge from a generator with a valid sludge quality certification under Env-Ws 807 shall be exempt from the requirement to obtain a site permit.

Env-Ws 804.03 Sludge Quality Certification Required.

(a) Except as provided in (b) and (c) below, no person shall land apply, distribute for land application, sell, or give away any sludge or sludge mixture, in bulk, from any generator that does not possess a valid sludge quality certification pursuant to Env-Ws 807.

(b) A sludge quality certification shall not be required for sludge produced at a facility where each constituent sludge has a sludge quality certification.

(c) A sludge quality certification shall not be required for sludge which is not used for land application.

Env-Ws 804.04 Permit and Sludge Quality Certification Application Review.

(a) Within 30 days of receipt of an application with the appropriate fee for a site permit, a facility permit, a sludge quality certification , or a permit modification pursuant to Env-Ws 804.08(f), the department shall determine if the application is complete.

(b) Upon determination by the department that an application for a site, facility, sludge quality certification, or a permit modification pursuant to Env-Ws 804.08(g) is not complete, the department shall provide written notice to the applicant identifying the deficiencies causing the application to be deemed incomplete.

(c) Upon determination by the department that a site or facility application, or a permit modification application pursuant to Env-Ws 804.08(g) is complete, the department shall:

(1) Provide written notice of completeness to the applicant and the governing body of the municipality(ies) which received notice pursuant to Env-Ws 803.01(b)(1);

(2) Make notice of a public hearing and comment period for the pending permit application in a newspaper of local circulation;

(3) Schedule and hold the hearing no sooner than 30 days after the newspaper notice in (2) above in the municipality in which the activity is proposed to occur; and

(4) Conduct the hearing in accordance with Env-C 203.

(d) The newspaper notice shall contain the following information:

(1) The name and mailing address of the applicant;

(2) The location, date, and the time of public hearing;

(3) The locally accessible place where the application can be reviewed;

(4) The name, address, and telephone number of the person in the department receiving comments;

(5) The type of activity to be conducted;

(6) The proposed location of the site or facility;

(7) The name of the owner; and

(8) The deadline for submission of written comments.

(e) At the hearing:

(1) The applicant shall:

a. Make available 3 copies of the application, site plan, management plan, and, if applicable, the facility plan, the groundwater monitoring plan and the closure plan for the public to review;

b. Make a presentation to the public summarizing all the information required in the application, the site plan, the management plan and, if applicable, the facility plan, the groundwater monitoring plan, and the closure plan; and

c. Respond to all questions concerning the proposed sludge management activity; and

(2) After the applicant has responded to all questions concerning the proposed activity, the department shall:

a. Receive public comments on the application and supporting information as to its accuracy; and

b. Receive all other public comments.

(f) The department shall allow 15 days from the date of the hearing to receive written comments.

(g) Subject to (h) below, within 120 days of receipt of a complete application, the department shall issue or deny the site or facility permit, the sludge quality certification or the permit modification based on the criteria specified in Env-Ws 806.05, Env-Ws 808.05, Env-Ws 807.03, or Env-Ws 804.08, as applicable, and shall send written notice of its decision to the applicant and, in the case of a permit modification or a site or facility permit, to the governing body of the municipality(ies) to which the notice was sent pursuant to Env-Ws 803.01(b)(1).

(h) The time spent waiting for the applicant to provide any requested information shall not be included when calculating the 120 days in (g) above.

(i) If the information submitted with any complete application is insufficient for the department to make a determination that the proposed activity will comply with the applicable requirements of RSA 485-A and these rules, the person proposing to undertake the activity shall provide such additional information as the department determines is necessary to make the determination. If the additional information is not submitted within 60 days of the department's request, the application shall be denied.

(j) If site-specific conditions or limitations are necessary to protect public health or safety or the environment, the department shall include such conditions or limitations in the site or facility permit or sludge quality certification that is issued.

(k) If a permit modification pursuant to Env-Ws 804.08(g), a site or a facility permit, or sludge quality certification is denied, the department shall provide written notification to the applicant and, in the case of a permit modification or a site or facility permit application, the municipality identified in Env-Ws 803.01(b) noting the appropriate sections of the rules and stating the specific reasons for the denial, and shall inform the applicant that the decision may be appealed to the water council in accordance with RSA 21-O:7.

Env-Ws 804.05 Suspension, Revocation or Refusal to Renew.

(a) If after issuing a permit or a sludge quality certification the department receives information which indicates that good cause, as set forth in (f) below, exists to suspend or revoke the permit or certification, the department shall proceed in accordance with Env-C 200.

(b) After proceeding in accordance with Env-C 200, the department shall revoke the permit or sludge quality certification if the department determines that the reason for good cause cannot be corrected to conform to applicable requirements.

(c) After proceeding in accordance with Env-C 200, the department shall suspend the permit or sludge quality certification, subject to (d) below, if the department determines that, while good cause exists, the reason that good cause exists can be corrected to conform to applicable requirements.

(d) If a permit or sludge quality certification is suspended pursuant to (c) above, the department shall not reinstate the permit or certification until:

(1) The reason for good cause has been corrected to conform with applicable requirements; and

(2) The permittee submits a written request to the department requesting that the permit or sludge quality certification be reinstated.

(e) If after receiving a request for renewal of a permit or sludge quality certification the department receives information which indicates that good cause, as set forth in (f) below, exists to refuse to renew the permit or certification, the department shall proceed in accordance with Env-C

200 and refuse to renew the permit or sludge quality certification until the reason for good cause has been corrected to conform with applicable requirements.

(f) Good cause to revoke or refuse to renew a permit or sludge quality certification shall include the following:

(1) The permit or sludge quality certificate holder has not complied with the conditions of the permit or these rules;

(2) The plans submitted with the application do not accurately portray the actual site, facility, or management activities;

(3) Any other information submitted in support of the application is not true and complete or is misleading;

(4) The permit or sludge quality certificate holder has failed to comply with an order of the department relative to sludge management, including an order to undertake corrective measures;

(5) The permit or sludge quality certificate holder has failed to comply with an order of the department relative to a violation of any other statute administered by the department; or

(6) The permit or sludge quality certificate holder has failed to pay any administrative, civil, or criminal penalties owed to the department.

Env-Ws 804.06 Permit Transfer.

(a) A sludge hauler permit shall be issued to the applicant for the vehicles identified in the application and shall not be transferred by the permit holder to any other person unless prior approval is obtained from the department in accordance with (c) through (e) below.

(b) A site or facility permit shall be issued to the applicant and shall not be transferred by the permit holder to any other person unless prior approval is obtained from the department in accordance with (c) through (e) below.

(c) The person wishing to transfer a permit shall submit to the department:

(1) A copy of the original application;

(2) A copy of the permit;

(3) The name, address and telephone number of the person(s) to whom the permit will be transferred; and

(4) An application for a permit modification pursuant to Env-Ws 804.08(b) and (c) for any changes that are proposed to the permit, the site plan, the facility plan, closure plan,

or the management plans, as applicable.

(d) The person to whom the permit is proposed to be transferred shall submit a statement declaring whether the person has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application or of a felony in any state or federal court within the 10 years prior to the date of application.

(e) The department shall approve such transfer if:

(1) The permit holder is in compliance with these rules and the permit;

(2) Any proposed changes are in accordance with Env-Ws 804.08;

(3) Good cause as defined by Env-Ws 804.05(f) to suspend, revoke, or refuse to renew the permit does not exist, unless the reason that good cause exists can be corrected prior to or as a result of the permit transfer; and

(4) The person to whom the permit is proposed to be transferred has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court within the 10 years prior to the date of application.

Env-Ws 804.07 Transfer of Land Ownership.

(a) If land that has a facility or site permit associated with it is transferred to a new owner, then the permit holder shall notify the department within 10 days of the transfer and shall suspend all activities covered by the permit until the statement described in (c) below is signed by the new property owner and is received by the department.

(b) If a signed statement as described in (c) below does not accompany the notice of land transfer, then upon receipt of the notice the department shall commence a proceeding under Env-C 200 to revoke the permit. If the permit holder obtains and submits the signed statement the proceeding shall be terminated.

(c) The statement from the new owner shall state that:

(1) The new owner is aware that the site or facility exists on the land;

(2) The new owner agrees to the continued operation of the site or facility; and

(3) The new owner has given permission to the permit holder to enter upon the land for purposes of investigation and operation, including the implementation of remedial measures if ordered by the department.

(d) If the new owner chooses to discontinue the activities covered by the site or facility permit, the permit holder shall:

(1) Submit a written statement to the department indicating that the activities have been discontinued;

(2) Remove any infrastructure specific to the activities that were subject to the permit; and

(3) If a facility, close the facility in accordance with the approved closure plan.

Env-Ws 804.08 Modification for Site or Facility Permits.

(a) The department shall modify the conditions of a permit without request by the permit holder in order to achieve compliance with these rules.

(b) In the event of any such modification the department shall:

(1) Provide written notice to the permit holder stating the proposed modifications and the reason(s) for the modification(s);

(2) Provide the permit holder 30 days from the date of the written notice to comment in writing on the proposed permit modification(s);

(3) After considering the permit holder's written comments, if any, issue a revised permit with a timetable for bringing the permit holder's activities into compliance with the revised conditions of the permit; and

(4) Notify the permit holder that he/she may request an adjudicatory hearing in accordance with Env-C 200 if aggrieved by the department's decision.

(c) The permit holder shall apply to the department to renew a site or facility permit, to modify a site or facility permit or to modify any permitted management activity prior to implementing any changes.

(d) The permit holder shall provide the following information to the department:

(1) The site or facility permit number;

(2) The name, address, and telephone number of the permit holder, owner, operator, and generator;

(3) A detailed description of all proposed modifications;

(4) A revised site, facility, management or closure plan highlighting the proposed changes;

(5) If applicable, revised facility plans and specifications for construction and closure stamped by a New Hampshire registered professional engineer;

(6) An explanation of why the proposed change(s) is necessary or desirable;

(7) The effect of the modification on the site's or facility's capacity and life expectancy and service area;

(8) Identification and status of all other federal or state permits or approvals necessary to effect the proposed modification(s);

(9) The permit holder's proposed schedule for implementing such changes;

(10) A list and status of any outstanding violations, accompanied by a statement from the permit holder indicating how full compliance shall be attained prior to approval of the modification; and

(11) A list of any current abutters to whom the notice was not provided at the time of the original application.

(e) The department shall approve the modification if it determines that:

(1) All applicable requirements of these rules have been met;

(2) If the applicant is other than the owner, the owner has given permission to the applicant for the modification;

(3) All other state permits which are necessary for the proposed modification have been applied for;

(4) Management of the sludge at the site or facility in accordance with the proposed modification will not violate any statutes or rules administered by the department; and

(5) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department.

(f) Subject to (g) below, applications to modify a permit shall be approved or denied within 30 days of receipt of the information required in (d) above.

(g) If the proposed permit modification increases the quantity of sludge being managed at the site or facility by more than 20% from the quantity specified in the current permit , the modification shall be processed in accordance with Env-Ws 803 and Env-Ws 804.04.

## PART Env-Ws 805 SLUDGE HAULER PERMIT REQUIREMENTS

Env-Ws 805.01 Sludge Hauler Permit Applications.

(a) Any applicant for a permit to remove or transport sludge derived from human waste which is not class A on public roads shall provide the following information on a form obtained from the department:

(1) The name, address, and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone numbers of the applicant's business and contact person;

(3) Any telephone numbers to be used in case of emergency;

(4) The vehicle identification number and license plate number for each vehicle which will be used to transport containers carrying sludge;

(5) The name, principal place of business, and telephone number of the sludge transporting company that will appear on both sides of the vehicle, which will be used to transport the container(s) carrying the sludge, unless identified pursuant to Env-Ws 805.06(d); and

(6) Whether the applicant or owner has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application.

(b) Each application shall be accompanied by the fee specified in Env-Ws 805.04.

(c) Each application shall be accompanied by a certification that upon issuance of the permit, the applicant shall assume complete responsibility for ensuring that all persons who will be transporting sludge with the applicant's vehicle(s) are familiar with the requirements of these rules.

(d) Each application shall be accompanied by a statement signed by the applicant stating that all vehicles and container(s) proposed to be used to transport sludge have met all applicable federal and state requirements for sludge transportation.

Env-Ws 805.02 Expiration of Sludge Hauler Permits. Sludge hauler permits issued after January 1, 1999, shall have a duration of 2 years or less and shall expire on January 31 of the odd numbered year following the date of issuance.

Env-Ws 805.03 Renewal of Sludge Hauler Permits. Any person to whom a sludge hauler permit has been issued, and who wishes to renew the permit, shall submit the information required in Env-Ws 805.01 and the permit fee specified in Env-Ws 805.04 to the department not less than 30 days prior to expiration of the permit.

Env-Ws 805.04 Sludge Hauler Permit Fee.

(a) A fee in the amount of $100 for each vehicle used to carry sludge shall accompany each application for issuance or renewal of a sludge hauler permit. If vehicles are replaced or added by the hauler, the hauler shall provide all required registration information to the department along with the additional fee for each vehicle to be added.

(b) The fee, if paid by check or money order, shall be made payable to "Treasurer-State of NH."

(c) The fee shall not be prorated or refunded if the permit term established pursuant to Env-Ws 805.02 is less than a full 2 years.

(d) Any municipality that transports its own sludge shall be exempt from the fee specified above.

Env-Ws 805.05 Criteria for Review. The department shall issue or renew a sludge hauler permit, within 30 days of receipt of the information required in Env-Ws 805.01, for the vehicle(s) specified in the application, if it determines that the following criteria have been met:

(a) All applicable requirements of these rules have been met;

(b) The applicant submits a signed statement stating that all vehicles and containers, proposed to transport sludge comply with all applicable, federal and state requirements required for sludge transportation;

(c) The applicant has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application; and

(d) The applicant has paid all fees and administrative, civil, or criminal penalties owed to the department.

Env-Ws 805.06 Identification of Vehicle(s).

(a) A copy of the sludge hauler permit shall be retained in the vehicle at all times.

(b) Each sludge hauler shall display the name, principal place of business, and telephone number of the hauler or transporting company on both sides of the vehicles, used to transport sludge, unless exempt pursuant to (d) below.

(c) The information required by in (b) above shall be in permanent and legible lettering at least 3 inches high.

(d) Municipal vehicles which bear the municipal seal on each side of the vehicle shall not need further identification.

(e) Labeling of containers shall be required when transporting class B sludge. This labeling shall be legible, visible and mounted curbside in 3 inch tall lettering and shall read "class B sludge."

Env-Ws 805.07 Maintenance of Containers and Vehicles. Any hauler who has been issued a permit pursuant to Env-Ws 805 shall maintain all containers and vehicles used to transport sludge, in accordance with the following:

(a) Each container and vehicle shall be maintained so as not to create unreasonable malodors or public health hazards;

(b) Each container transporting sludge from which free water might be released during transport shall be watertight;

(c) All piping, valves, and rigid or flexible connections shall be accessible and capable of being cleaned;

(d) All inlet and outlet connections shall be constructed and maintained such that no material will leak, spill, or run out of the container during transfer or transportation; and

(e) Discharge outlets shall be designed to control the flow of discharge without spraying or flooding the receiving area.

Env-Ws 805.08 Transportation of Sludge.

(a) Sludge, derived from human waste which is not class A, being transported to a land application or stockpile site shall meet class B requirements.

(b) All sludge shall receive a sludge quality certification in accordance with Env-Ws 807 prior to being transported to a site permitted under these rules.

(c) All containers used for transporting sludge shall be covered during transport to minimize odors.

(d) Containers transporting sludge shall not be placed for longer than 24 hours at a place that does not have a site or facility permit.

(e) All containers shall be inspected by the driver prior to transport on public roads to ensure that sludge will not leak, spill, or run out of the container during transfer or transportation.

(f) All vehicles and containers used to transport sludge shall conform to all applicable federal and state requirements for sludge transportation.

Env-Ws 805.09 Change of Vehicles. Whenever a permit holder obtains an additional or replacement vehicle, for transporting the containers, the permit holder shall:

(a) Notify the department in writing prior to placing the vehicle in service to transport sludge;

(b) Supply the identification number and license plate number for the vehicle(s); and

(c) Submit the additional fee, if required under Env-Ws 805.04.

Env-Ws 805.10 Record keeping.

(a) Each sludge hauler permit holder shall record the following information, on a form provided by the department, for each load of sludge:

(1) The date the sludge is transported from the generator's site or facility;

(2) The generator'(s) name, address, and telephone number;

(3) The quantity of sludge, in wet tons;

(4) The type of sludge, such as domestic or industrial;

(5) The name, address, and telephone number of the hauler permit holder and driver of the motorized vehicle;

(6) The name, address, and telephone number of the site(s), facility(ies), solid waste facility(ies), or wastewater treatment facility to which the sludge is to be delivered; and

(7) The date delivered to the site or facility.

(b) The information required in (a) above shall be maintained in the vehicle used to transport the sludge when the sludge is being transported.

(c) Records shall be maintained for a minimum of 5 years after expiration of the hauler permit.

Env-Ws 805.11 Reporting. Each hauler shall provide the information required by Env-Ws 805.10(a) monthly to the operator of the site, facility, solid waste facility or wastewater treatment facility, to which the sludge is delivered by no later than the 15th of the following month.

Env-Ws 805.12 Accidental Release.

(a) In the event of an accidental release of sludge, the permit holder shall:

(1) Immediately take action to contain the spill, minimize the environmental impact, and begin clean up procedures;

(2) Subject to (b) below, notify the department within 24 hours of the release with the following information:

a. The date, time and location of the spill;

b. The quantity of sludge spilled and the quantity of sludge recovered, in wet tons;

c. The quantity and final disposition of any sludge that was not recovered;

d. The hauler's permit number and the name and telephone number of the driver involved in the incident;

e. The name and telephone number of the generator;

f. The approximate distance to any surface waters and storm drains within 100 feet of the spill;

g. The actions taken to control the extent of the spill and minimize the environmental impact; and

h. Future actions necessary to clean up the spill, if applicable.

(b) Notification to the department shall not be required if all of the following conditions are met:

(1) The discharge is less than 25 gallons or 5 cubic feet if the sludge contains greater than 10 percent solids;

(2) The discharge is immediately contained;

(3) The discharge is completely removed within 24 hours; and

(4) There is no impact to groundwater or surface water.

**PART Env-Ws 806 SITE PERMIT REQUIREMENTS**

Env-Ws 806.01 Site Permit Applications.

(a) The person proposing to undertake the sludge management activities at the site shall apply for the site permit.

(b) The applicant shall provide the following information on a form obtained from the department:

(1) The name, address, and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone number of the applicant's business;

(3) The name and telephone number of the person who can be reached 24 hours a day in case of an emergency;

(4) The location of the proposed site, including street address, tax map and lot number, and current deed reference;

(5) The site owner's name, address, and telephone number;

(6) The name, mailing address, and telephone numbers of each operator of the site, including each person's responsibility as it pertains to the regulated activities;

(7) The type(s) of land application activity(ies) being proposed for the site, including but

not limited to agricultural land application, forest application, reclamation, or stockpiling;

(8) A description of the use of the site, including agricultural operations and crops grown on each field, if applicable, covering 5 years immediately prior to submission of the application; and

(9) Whether the applicant has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application or of a felony in any state or federal court during the 10 years prior to the date of application.

(c) The following shall be submitted with the application:

(1) The site plan prepared in accordance with Env-Ws 806.06, and a copy which has been reduced to a size of 8½ X 11 inches or 11 X 14 inches;

(2) The management plan prepared in accordance with Env-Ws 806.07;

(3) If reclamation is proposed, the groundwater monitoring plan required in Env-Ws 809.02;

(4) A statement signed by the applicant certifying:

a. Compliance with the notification provisions of Env-Ws 803.01;

b. That all operators of the site will be instructed on the requirements of Env-Ws 800 prior to working at the site;

c. That a copy of the application has been given to the governing body of the municipality in which the activity is proposed to occur; and

d. That the information submitted is accurate;

(5) A copy of the Natural Resource Conservation Service county soils survey map, or portion thereof, with the area(s) of proposed activity clearly delineated, including a description of each soil type found on the site;

(6) The description of the soil profile characteristics of each soil test pit or auger boring as required in Env-Ws 806.10(c);

(7) An original of the most recent USGS map, largest scale available, with the latitude and longitude specified, showing the approximate location and boundaries of the site;

(8) The results of the soil analyses conducted in accordance with Env-Ws 806.10;

(9) Written verification from the department of resources and economic development indicating whether or not threatened or endangered species exist on the site;

(10) For all reclamation sites and forest application sites, a site-specific soil map or survey prepared in accordance with the Site-Specific Soil Mapping Standards for New Hampshire and Vermont, Society of Soil Scientists of Northern New England Publication No. 3, dated June 1998;

(11) A list of all other state permits which are required for the proposed site and evidence that applications for those permits have been submitted; and

(12) The name and address of the locally accessible place where all information required in Env-Ws 806.01 can be reviewed.

(d) If the applicant is not the owner, the application shall be accompanied by a written statement in accordance with (e) below, and signed by the owner.

(e) The written statement shall say that the owner is aware that the application is being filed and has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the sludge land application or stockpile site in the event that the department issues the permit.

(f) If the applicant is not the generator of the sludge(s), the application shall be accompanied by a written statement signed by each generator stating that the generator is ultimately responsible for ensuring that the final disposition of the material is performed in accordance with these rules and 40 CFR part 503.

(g) Each application shall be:

(1) Signed by the applicant;

(2) Submitted in duplicate; and

(3) Accompanied by the fee specified in Env-Ws 806.04.

Env-Ws 806.02 Expiration of Site Permits.

(a) Except as provided in (c) below, a site permit issued by the department shall expire 5 years from the date on which it was issued.

(b) Any person land applying or stockpiling sludge at a site which previously did not require a permit under Env-Ws 800 shall:

(1) Within 90 days from the effective date of the 1999 amendments to Env-Ws 800, comply with all applicable provisions of Env-Ws 800 other than notification and permitting; and

(2) Within 120 days of the effective date of the 1999 amendments to Env-Ws 800,

submit an updated site plan and management plan.

(c) A site permit issued by the department for land application of a sludge which is certified as a low metals sludge under Env-Ws 807.03(h) shall expire 10 years from the date on which it was issued.

Env-Ws 806.03 Renewal of Site Permits. Any person to whom a site permit has been issued who wishes to renew the permit shall apply for a permit modification under Env-Ws 804.08(c) and submit the permit fee required in Env-Ws 806.04 to the department no later than 120 days prior to expiration of the permit.

Env-Ws 806.04 Permit Fees.

(a) A fee in the amount of $300 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with greater than 10 acres.

(b) A fee in the amount of $150 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with greater than 5 but less than or equal to 10 acres.

(c) A fee in the amount of $100 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with 5 or fewer acres.

(d) Fees, if paid by check or money order, shall be made payable to "Treasurer-State of NH."

(e) Sites where only sludge from New Hampshire municipalities is land applied shall be exempt from the fees specified in (a) through (c) above.

Env-Ws 806.05 Criteria for Review. The department shall issue a site permit if it determines that:

(a) All applicable requirements of these rules have been met;

(b) If the applicant is other than the owner, the owner has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the site in the event that the department issues the permit;

(c) All other state permits which are necessary for the operation of the site have been applied for;

(d) Management of sludge at the site in accordance with the application will not violate any statutes or rules implemented by the department;

(e) The permit holder has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application;

(f) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department;

(g) The permit holder has submitted all test results and reports required for a site permit pursuant to Env-Ws 806.01; and

(h) The proposed use of sludge will not adversely affect threatened or endangered species.

Env-Ws 806.06 Site Plans. Site plans required under Env-Ws 806.01(c)(1) shall be based upon a municipal tax map, a surveyed plan, or other scaled drawing which:

(a) Identifies the proposed site location at a scale appropriate to delineate the information clearly; and

(b) Shall be marked to show:

(1) A locus map which identifies the proposed site location at a scale appropriate to delineate the information clearly;

(2) The total land area, in acres, to be used for land application;

(3) The land area of each field, in acres, identified by unique field designation(s) and corresponding crop(s) proposed to be grown;

(4) The identification of access roads, access control measures, and buffer distances;

(5) The proposed stockpile or storage tank location(s);

(6) The identification of any easements which exist on the property;

(7) The identification of proposed measures to control surface water runoff to or from the site and stockpile locations, if applicable;

(8) The identification of surrounding land use, roads, and property lines within 500 feet of the site;

(9) All soil test pit and auger boring locations;

(10) The approximate location of and distance to all dwellings, structures, and water supply wells within 500 feet of the site;

(11) The names and addresses of all abutters;

(12) The name and location of all surface waters within 500 feet of the site, including their designated river classification under RSA 483, New Hampshire rivers management and protection program, if applicable;

(13) The scale of the plan;

(14) An arrow indicating which direction on the plan is north;

(15) The approximate location of all poorly and very poorly drained soils on the site; and

(16) If reclamation is proposed, the items required in the groundwater monitoring plan specified in Env-Ws 809.02(b).

Env-Ws 806.07 Management Plans. Each management plan required under Env-Ws 806.01(c)(2) shall include the following:

(a) The normal hours of operation of the site;

(b) Proposed route(s) of access to the site;

(c) The method of application, if land applying;

(d) Stockpiling management provisions, if applicable;

(e) The name of the generator(s) and its corresponding sludge quality certification number(s) for any sludge which will be received at the site;

(f) The quantity of sludge, in wet tons, expected on a periodic basis, such as daily, weekly or monthly, and the estimated annual tonnage;

(g) The quantity of sludge, in wet tons, expected over the entire life expectancy of the site;

(h) A description of all sludge mixing activities which are proposed for the site;

(i) A description of the record keeping procedures;

(j) A detailed odor control plan explaining:

(1) The procedures that shall be used to address and resolve any odor complaints;

(2) The name, address, and telephone number of the person(s) who shall be responsible for responding to odor complaints; and

(3) Site management techniques that shall be employed to minimize odors;

(k) A nutrient management plan, for the final sludge mixture to be land applied for each field, specific for each crop or vegetation type, containing the following information:

(1) The crops or vegetation to be grown;

(2) A copy of the farm or site nutrient management recommendations developed in accordance with guidelines of UNH cooperative extension, USDA, NH department of

agriculture, NRCS or other certified agricultural or crop advisors;

(3) The agronomic rate calculations for land application of sludge on agricultural lands, performed in accordance with the "Best Management Practices: Biosolids" published by the UNH cooperative extension, and based on the nutrient content of the sludge or sludge mixture that is proposed to be land applied, unless sludge or sludge mixture specific data, obtained by a qualified professional, and/or site-specific crop yields or production records are available for agronomic rate and crop fertilization determinations;

(4) The agronomic rate calculations for land application of sludge on forested land or for reclamation, performed in consultation with UNH cooperative extension ,USDA, NH department of agriculture, NRCS or other certified agricultural or crop advisors;

(5) The proposed disposition of crops grown;

(6) The proposed type and amount of all other soil amendments and nutrient sources to be used on the site;

(7) The proposed annual nitrogen loading and, except for sites where only sludge certified as low metals is applied, the annual metals loading calculations; and

(8) Except for sites where only sludge certified as low metals is applied, calculation of the cumulative metals' loading to date; and

(l) Any other best management practice(s) which shall be implemented at the site to ensure compliance with these rules.

Env-Ws 806.08 Land Application Standards.

(a) Sludge shall be land applied at rates that conform to the approved nutrient management plan for the site permit pursuant to Env-Ws 806.07(k) and Env-Ws 806.12(a)(5)

(b) No spreading of sludge shall be done on frozen or snow-covered ground or when the ground is saturated due to precipitation or flooding.

(c) No sludge shall be spread on agricultural land which has a slope greater than 15 percent, that is, a 15 foot rise in 100 feet.

(d) Sludge spread on agricultural land which has a slope greater than 8 percent shall contain a minimum of 15 percent solids or be subsurface injected.

(e) Sludge shall be spread in an even layer so as not to result in ponding or runoff of material.

(f) Sludge which is to be land applied shall be processed to minimize visible or identifiable plastics or other non-biodegradable solids.

(g) No spreading of sludge shall be done on very poorly drained soils.

(h) No spreading of sludge shall be done in the floodway, defined as the stream channel plus that portion of the overbanks that must be kept free from encroachment in order to discharge the one percent annual chance flood without increasing flood levels by more than one foot, which is adopted into a local floodplain management ordinance.

(i) Animals shall not be grazed on land on which sludge has been land applied until 45 days after the last application of sludge unless methods to reduce adherence to the crop or vegetation are used in conformance with the approved management plan.

(j) Unless otherwise required by RSA 483, New Hampshire rivers management and protection program, sludge shall be incorporated into the soil within 48 hours of spreading unless it is used for top dressing.

(k) Reclamation and forest sites shall be posted, for the life of the permit, with signs which:

(1) Contain the name and telephone number of the operator;

(2) State "This is a sludge land application site";

(3) Are printed with block letters no less than 2 inches in height, and with the name and address of the owner or lessee of the property; and

(4) Are posted not more than 100 yards apart on all sides and shall also be posted at gates, bars, and commonly used entrances.

(l) Except for sites where only sludge certified as low metals is applied, all sludge and mixtures of sludge to be land applied shall not exceed any of the following lifetime cumulative pollutant loading rates:

(1) For arsenic, 10 kilograms per hectare or 9 pounds per acre;

(2) For cadmium, 5 kilograms per hectare or 4.5 pounds per acre;

(3) For chromium, 300 kilograms per hectare or 268 pounds per acre;

(4) For copper, 300 kilograms per hectare or 268 pounds per acre;

(5) For lead, 200 kilograms per hectare or 178.6 pounds per acre;

(6) For mercury, 5.6 kilograms per hectare or 5.0 pounds per acre;

(7) For molybdenum, 18 kilograms per hectare or 16 pounds per acre;

(8) For nickel, 100 kilograms per hectare or 89.3 pounds per acre;

(9) For selenium, 100 kilograms per hectare or 89 pounds per acre; and

(10) For zinc, 500 kilograms per hectare or 446.5 pounds per acre.

(m) For sludge not generated in New Hampshire, the rate of sludge application shall conform to the application rate allowed by the state of origin or Env-Ws 800, whichever results in the lower loading rate.

(n) For sludge not generated in New Hampshire, groundwater monitoring in accordance with Env-Ws 809 shall be required for sludge management activities which would require groundwater monitoring in the state of origin.

(o) No person shall land apply or store sludge within the buffer areas specified in Table 806-I, subject to (p) below:

TABLE 806-I
Buffer Distances (in feet)

For Land Application:

| | |
|---|---|
| Surface Water | 125[a] |
| Non-tidal Drainage Ditch | 33 |
| Community Wells[b] | 400 |
| Other Wells | 300 |
| Surface Drinking Water Source | 500 |
| Property Lines | 100[c] |
| Public Roads other than Federal Interstate Highways | 25 |
| Federal Interstate Highways | 10 |
| On-site Occupied Dwelling | 100 |
| Off-site Occupied Dwelling: | |
| If used for top dressing | 500[d] |
| If incorporated within 48 hours | 200[d] |
| Bedrock / Restrictive Layer | 2 |
| Groundwater Depth: | |
| Reclamation | 4[e] |
| Land Application | 2[e] |

For Stockpiling or Storage:

| | |
|---|---|
| Surface Drinking Water Source | 500 |
| Nearest Occupied Dwelling | 500[f] |
| Nearest Well | 500[g] |
| Property Line | 100[c] |
| Bedrock / Restrictive Layer | 4 |
| Groundwater Depth | 2[i] |
| Surface water | 250[h] |

| | |
|---|---|
| Non-tidal Drainage Ditch | 100 |

(p) The following shall apply to Table 806-I:

(1) Unless otherwise required by RSA 483, New Hampshire rivers management and protection program, the letter "a" shall indicate that the distance to surface waters may be reduced from 125 feet to 75 feet if the material is incorporated within 48 hours and the slope is less than 8 percent.

(2) The letter "b" shall indicate those community public water supply wells which withdraw greater than 57,600 gallons over a 24-hour period.

(3) The letter "c" shall indicate that the distance to property lines may be reduced through written agreement with affected party(ies).

(4) The letter "d" shall indicate that the distance to an off-site occupied dwelling may be reduced to 100 feet through written agreement with affected parties.

(5) The letter "e" shall indicate that this shall be the distance to the groundwater at the time of application of sludge.

(6) The letter "f" shall indicate that the distance to the nearest occupied dwelling shall be as far as practical beyond 500 feet, but can may be reduced below 500 feet with the occupant's prior written consent.

(7) The letter "g" shall indicate that the distance to the nearest well shall be as far as practical, but in no case closer than 500 feet.

(8) The letter "h" shall indicate that the distance to surface water may be reduced to 125 feet if the slope of the land to the surface water is less than 5% and a vegetated buffer strip of at least 25 feet is maintained between the stockpile and the surface water.

(9) The letter "i" shall indicate that the distance is to the seasonal high water table.

Env-Ws 806.09 Sludge Stockpiling.

(a) Any person stockpiling sludge for longer than 7 days shall cover the stockpile with an odor control material, such as lime, wood ash which has been approved for such use pursuant to Env-Wm 3400, or cement kiln dust, to minimize odors.

(b) Stockpiles of sludge shall be maintained to minimize surface water run-on and run-off.

(c) Stockpiling of sludge shall not be permitted for greater than 48 hours on the 100-year flood plain as defined and delineated by the flood insurance rate maps published by the US Department of Housing and Urban Development or the Federal Emergency Management Agency.

(d) Stockpiling of sludge shall not be permitted on any poorly or very poorly drained soils.

Env-Ws 806.10 Testing.

(a) One soil test pit or auger boring shall be taken, at a depth of at least 40 inches, for each soil mapping unit present on the Natural Resource Conservation Service county soils map, but no less than one every 5 acres.

(b) One soil test pit or auger boring shall be taken, at a depth of at least 4 feet, for each area proposed for stockpiling.

(c) An analysis of the soil test pits or auger borings required in (a) and (b) above shall be performed and shall include a description of the soil profile characteristics, depth to seasonal high watertable, and depth to bedrock or other restrictive layer.

(d) Soil samples from each field proposed to be used for the land application of sludge, shall be collected within 6 months prior to submittal of the permit application.

(e) Soil samples, from each field upon which sludge has been applied, shall be collected within 3 months prior to the end of the permit term or at the cessation of land application.

(f) The soil samples in (d) and (e) above shall be analyzed by a laboratory certified to analyze water for metals, under Env-C 300 for the following constituents:

(1) Arsenic, measured as mg/kg;

(2) Cadmium, measured as mg/kg;

(3) Chromium, measured as mg/kg;

(4) Copper, measured as mg/kg;

(5) Lead, measured as mg/kg;

(6) Mercury, measured as mg/kg;

(7) Molybdenum, measured as mg/kg;

(8) Nickel, measured as mg/kg;

(9) Selenium, measured as mg/kg; and

(10) Zinc, measured as mg/kg.

(g) Soil samples from each field used for sludge land application shall be collected on a yearly basis no more than 90 days prior to the initial application for that year and analyzed by UNH

analytical services, or by a laboratory using a method that produces similar results to those produced by UNH analytical services, for:

(1) Soil acidity, measured as pH;

(2) Buffer pH;

(3) Texture;

(4) Calcium;

(5) Magnesium;

(6) Potassium;

(7) Phosphorus; and

(8) Organic matter.

Env-Ws 806.11 Record keeping.

(a) Every site permit holder shall maintain records of each load of sludge received at the site, including identification of:

(1) The date received;

(2) The name of the hauler delivering the load;

(3) The generator and quantity of each load of sludge received, in wet tons, and percent solids;

(4) The sludge quality certification number(s); and

(5) The date land applied and the amount spread on each field.

(b) Except for sites where only sludge certified as low metals sludge is applied, every site permit holder shall maintain records of the annual and cumulative metal loadings for the site on a field by field basis. In the calculation of annual metals loadings, the permit holder shall use the highest concentration of each metal observed on a dry weight basis, based on testing performed by the generator(s) during the previous 12 months.

(c) Site plans, management plans, and records shall be maintained by the permit holder, and shall be available to the department for review during business hours. If the department believes that violations of RSA 485-A or these rules relative to sludge management have occurred, the department shall require the permit holder to submit copies of all records.

(d) Site plans, management plans, and records shall be maintained for a minimum of 5 years after the expiration of the permit(s) to which they relate.

Env-Ws 806.12 Reporting.

(a) At least 14 days prior to commencement of each yearly sludge land application activity, the permit holder shall submit the following information to the department for each site:

(1) The site name and address;

(2) The name of permit holder;

(3) The sludge quality certification numbers of the sludge(s) to be land applied;

(4) The permit number for the site; and

(5) An updated nutrient management plan as provided in Env-Ws 806.07(k).

(b) Every site permit holder shall submit an annual report for each site to the department by the last business day of January for each calendar year in which the permit is valid, regardless of whether or not the site received or processed sludge during the previous calendar year.

(c) The annual report shall contain the following information:

(1) The site location, including address and town;

(2) The permit number;

(3) The owner's name;

(4) The crops grown for each field and the crop disposition;

(5) The name and sludge quality certification number, if applicable, of each generator;

(6) The quantity of sludge, in wet and dry tons, applied to each field, from each generator;

(7) The total quantity of sludge, in wet and dry tons, applied to the entire site, from each generator;

(8) Except for sites where only sludge certified as low metals sludge is applied, the annual metals' loading and cumulative metals' loading to date for each field; and

(9) For reclamation sites, the groundwater monitoring report.

(d) If any of the information differs from that previously supplied to the department concerning the activity, the permit holder shall note those differences in the annual report.

## PART Env-Ws 807 SLUDGE QUALITY CERTIFICATION REQUIREMENTS

Env-Ws 807.01 Sludge Quality Certification Application. To apply for the sludge quality certification, the generator shall provide the following information:

(a) The name and address of the wastewater treatment facility or facility which has generated or will generate the sludge;

(b) The name, title, and telephone number of the operator of the treatment facility;

(c) For POTWs, a list and brief description of all industrial permittees and the permittee's limits, including a table containing the estimated quantity and physical and chemical characteristics of each discharge and the specific concentration limits in the permit for parameters reasonably expected to be present, being the information required to be maintained by POTWs for industrial discharges under Env-Ws 405.04(c);

(d) For industrial wastewater treatment facilities, the name and quantity of all chemicals being discharged to their treatment facilities, or for those facilities with a NPDES permit, a copy of the most recent NPDES permit application with a statement that the information is current;

(e) The quantity of sludge, in wet tons, generated monthly by the treatment facility for the last 2 years;

(f) If the sludge is not generated in New Hampshire, certification that the sludge meets the chemical standards for land application in the state of origin;

(g) If the sludge contains human waste, a description of the process to achieve class A or class B pathogen reduction requirements and vector attraction reduction requirements, including the applicable 40 CFR part 503 citation; and

(h) A sludge quality report which includes the following:

(1) A description of the treatment facility and sludge treatment process;

(2) A chronological summary of analytical data from the previous 3 years, if available, for each detected chemical, presented in accordance with (3) below;

(3) Data presented in tabular form and categorically for metals, volatile organic compounds, semi-volatile organic compounds, dioxins, and pesticides/herbicides; and

( 4) The results of testing required in Env-Ws 807.05(d), including laboratory reports, presented categorically as in (2) above.

Env-Ws 807.02 Sludge Quality Certification Fees.

(a) Each application shall be submitted in duplicate and shall be accompanied by a fee in the

amount of $1,000.

(b) Fees, if paid by check or money order, shall be made payable to "Treasurer-State of New Hampshire."

(c) Municipalities whose facilities are permitted by the department under RSA 485-A:13 shall be exempt from the fee specified in (a) above.

Env-Ws 807.03 Criteria for Review. The department shall issue a sludge quality certification to the wastewater treatment facility generating the sludge or the facility processing or treating sludge, if it determines that the information submitted demonstrates that the sludge:

(a) Is not a hazardous waste as defined in RSA 147-A:2,VII;

(b) If derived from human waste, consistently meets the pathogen and vector attraction requirements specified in the application;

(c) Does not exceed the following concentrations, expressed as the total concentration on a dry weight basis:

(1) For arsenic, 32 mg/kg;

(2) For cadmium, 14 mg/kg;

(3) For chromium, 1000 mg/kg;

(4) For copper, 1500 mg/kg;

(5) For lead, 300 mg/kg;

(6) For mercury, 10 mg/kg;

(7) For molybdenum, 35 mg/kg;

(8) For nickel, 200 mg/kg;

(9) For selenium, 28 mg/kg;

(10) For zinc, 2500 mg/kg;

(11) For polychlorinated biphenyls (PCB), 1.0 mg/kg; and

(12) For dibenzodioxins and dibenzofurans, 10 ng/kg TEQ for 2,3,7,8 TCDD and 2,3,7,8 TCDF; and 27 ng/kg for all congeners determined by EPA method 1613A using the 1989 toxic equivalency factors;

(d) Is of sufficiently consistent quality such that for the constituents in (c) above, the mean concentration for data submitted under Env-Ws 807.01(h) plus one standard deviation from the mean does not exceed 1.5 times the concentration specified in (c) above;

(e) Is not a threat to public health, safety, or the environment from other chemical contaminants when assessed according to risk methodologies described in the United States Environmental Protection Agency's Soil Screening Guidance, EPA/540/R-96/018 dated April 1996, the American Society for Testing and Material's E-1739-95, Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites dated November, 1995, or approved equal;

(f) If not generated in New Hampshire, meets the chemical standards of the state of origin;

(g) If the sludge is to be certified for reclamation use, contains enteric virus concentrations of less than one plaque-forming unit per 4 grams of solid on a dry weight basis. Class A sludges shall be deemed to have meet this standard; and

(h) If the sludge is to be certified as a low-metals sludge, does not exceed the following concentrations, expressed as the total concentration on a dry weight basis:

(1) For arsenic, 10 mg/kg;

(2) For cadmium, 10 mg/kg;

(3) For chromium, 160 mg/kg;

(4) For copper, 1000 mg/kg;

(5) For lead, 270 mg/kg;

(6) For mercury, 7 mg/kg;

(7) For molybdenum, 18 mg/kg;

(8) For nickel, 98 mg/kg;

(9) For selenium, 18 mg/kg; and

(10) For zinc, 1780 mg/kg.

Env-Ws 807.04 Expiration of Sludge Quality Certification.

(a) Subject to (b) below, sludge quality certifications shall expire 5 years from the date of issuance.

(b) For all generators in possession of an existing sludge quality certification, such certification shall expire one year from the effective date of 1999 amendments to Env-Ws 800.

(c) Generators of class A sludge shall:

(1) Within one year of the effective date of the 1999 amendments to Env-Ws 800, obtain a sludge quality certification; and

(2) Upon the effective date of the 1999 amendments to Env-Ws 800, comply with the requirements of Env-Ws 807.03(c), Env-Ws 807.03(e), Env-Ws 807.05(e), Env-Ws 807.05(f), Env-Ws 807.06, and Env-Ws 810.02.

Env-Ws 807.05 Testing.

(a) Subject to (b) below, upon submitting an application for a sludge quality certification, the applicant shall submit the results of the analyses of at least 4 representative samples of sludge from the treatment facility or facility, taken at least 60 days apart within the 12 months prior to the date of application and analyzed for the constituents in (d) below.

(b) For batch processes or specified quantities of sludge proposed for land application, a representative composite sample(s) from each batch or specified quantity may be collected on a one time basis according to the procedures in "An Addendum To The POTW Sludge Sampling and Analysis Guidance Document: Sludge Surface Disposal Sampling," by the United States Environmental Protection Agency dated May 1992 and analyzed for the constituents in (d) below.

(c) All samples shall be collected in accordance with the procedures described in "POTW Sludge Sampling And Analysis Guidance Document" by the United States Environmental Protection Agency, dated August 1989 or equal.

(d) Sludges collected according to (a) or (b) above shall be analyzed for the following constituents:

(1) Except for section I, enteric viruses, the compounds in Table 807-I, analyzed in accordance with the methods specified; and

(2) For generators of class B sludge requesting certification of their sludge for reclamation uses, enteric viruses as specified in Table 807-I, section I.

Table 807-I

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| **Section A. Volatile Organic Compounds** | | | | |
| 1 | Dichlorodifluoromethane | 75-71-8 | SW846 - 8000 series | 1.0 |
| 2 | Chloromethane | 74-87-3 | SW846 - 8000 series | 0.7 |
| 3 | Vinyl chloride | 75-01-4 | SW846 - 8000 series | 0.4 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 4 | Bromomethane | 74-83-9 | SW846 - 8000 series | 0.3 |
| 5 | Chloroethane | 75-00-3 | SW846 - 8000 series | 1.0 |
| 6 | Trichlorofluoromethane | 75-69-4 | SW846 - 8000 series | 1.0 |
| 7 | Diethyl ether | 60-29-7 | SW846 - 8000 series | 5.0 |
| 8 | Acetone | 67-64-1 | SW846 - 8000 series | 5.0 |
| 9 | 1,1-Dichloroethene | 75-35-4 | SW846 - 8000 series | 0.5 |
| 10 | Methylene chloride | 75-09-2 | SW846 - 8000 series | 0.1 |
| 11 | Carbon disulfide | 75-15-0 | SW846 - 8000 series | 0.2 |
| 12 | Methyl-tert-butylether (MTBE) | 1634-04-4 | SW846 - 8000 series | 2.0 |
| 13 | trans-1,2-Dichloroethene | 156-60-5 | SW846 - 8000 series | 1.0 |
| 14 | 1,1-Dichloroethane | 75-34-3 | SW846 - 8000 series | 1.0 |
| 15 | 2-Butanone (MEK) | 78-93-3 | SW846 - 8000 series | 1.0 |
| 16 | 2,2-Dichloropropane | 590-20-7 | SW846 - 8000 series | 1.0 |
| 17 | cis-1,2-Dichloroethene | 156-59-2 | SW846 - 8000 series | 1.0 |
| 18 | Chloroform | 67-66-3 | SW846 - 8000 series | 0.1 |
| 19 | Bromochloromethane | 74-97-5 | SW846 - 8000 series | 1.0 |
| 20 | Tetrahydrofuran (THF) | 109-99-9 | SW846 - 8000 series | 1.0 |
| 21 | 1,1,1-Trichloroethane | 71-55-6 | SW846 - 8000 series | 1.0 |
| 22 | 1,1-Dichloropropene | 563-58-6 | SW846 - 8000 series | 1.0 |
| 23 | Carbon tetrachloride | 56-23-5 | SW846 - 8000 series | 1.0 |
| 24 | 1,2-Dichloroethane | 107-06-2 | SW846 - 8000 series | 0.08 |
| 25 | Benzene | 71-43-2 | SW846 - 8000 series | 0.30 |
| 26 | Trichloroethene | 79-01-6 | SW846 - 8000 series | 0.8 |
| 27 | 1,2 Dichloropropane | 78-87-5 | SW846 - 8000 series | 0.1 |
| 28 | Dichlorobromomethane | 75-27-4 | SW846 - 8000 series | 0.02 |
| 29 | Dibromomethane | 74-95-3 | SW846 - 8000 series | 1.0 |
| 30 | 4-Methyl-2-pentanone (MIBK) | 108-10-1 | SW846 - 8000 series | 1.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 31 | cis-1,3-Dichloropropene | 10061-01-5 | SW846 - 8000 series | 0.5 |
| 32 | Toluene | 108-88-3 | SW846 - 8000 series | 1.0 |
| 33 | trans-1,3-Dichloropropene | 10061-02-6 | SW846 - 8000 series | 0.5 |
| 34 | 1,1,2-Trichloroethane | 79-00-5 | SW846 - 8000 series | 0.1 |
| 35 | 2-Hexanone | 591-78-6 | SW846 - 8000 series | 5.0 |
| 36 | 1,3-Dichloropropane | 142-28-9 | SW846 - 8000 series | 1.0 |
| 37 | Tetrachloroethene | 127-18-4 | SW846 - 8000 series | 1.0 |
| 38 | Dibromochloromethane | 128-48-1 | SW846 - 8000 series | 0.01 |
| 39 | 1,2-Dibromoethane | 106-93-4 | SW846 - 8000 series | 0.09 |
| 40 | Chlorobenzene | 108-90-7 | SW846 - 8000 series | 1.0 |
| 41 | 1,1,1,2-Tetrachloroethane | 630-20-6 | SW846 - 8000 series | 1.0 |
| 42 | Ethylbenzene | 100-41-4 | SW846 - 8000 series | 1.0 |
| 43 | m&p-Xylene | 108-38-3<br>106-42-3 | SW846 - 8000 series | 10 |
| 44 | o-Xylene | 95-47-6 | SW846 - 8000 series | 5.0 |
| 45 | Styrene | 100-42-5 | SW846 - 8000 series | 1.0 |
| 46 | Bromoform | 75-25-2 | SW846 - 8000 series | 0.1 |
| 47 | Isopropylbenzene | 98-82-8 | SW846 - 8000 series | 5.0 |
| 48 | 1,1,2,2-Tetrachloroethane | 79-34-5 | SW846 - 8000 series | 0.02 |
| 49 | 1,2,3-Trichloropropane | 96-18-4 | SW846 - 8000 series | 1.0 |
| 50 | n-Propylbenzene | 98-06-6 | SW846 - 8000 series | 5.0 |
| 51 | Bromobenzene | 108-86-1 | SW846 - 8000 series | 1.0 |
| 52 | 1,3,5-Trimethylbenzene | 108-67-8 | SW846 - 8000 series | 5.0 |
| 53 | 2-Chlorotoluene | 95-49-8 | SW846 - 8000 series | 1.0 |
| 54 | 4-Chlorotoluene | 106-43-4 | SW846 - 8000 series | 1.0 |
| 55 | tert-Butylbenzene | 104-51-8 | SW846 - 8000 series | 5.0 |
| 56 | 1,2,4-Trimethylbenzene | 95-63-6 | SW846 - 8000 series | 5.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 57 | sec-Butylbenzene | 135-98-8 | SW846 - 8000 series | 5.0 |
| 58 | p-Isopropyltoluene | 99-87-6 | SW846 - 8000 series | 5.0 |
| 59 | 1,3-Dichlorobenzene | 541-73-1 | SW846 - 8000 series | 5.0 |
| 60 | 1,4-Dichlorobenzene | 106-46-7 | SW846 - 8000 series | 5.0 |
| 61 | n-Butylbenzene | 104-51-8 | SW846 - 8000 series | 5.0 |
| 62 | 1,2-Dichlorobenzene | 95-50-1 | SW846 - 8000 series | 5.0 |
| 63 | 1,2-Dibromo-3-chloropropane | 96-12-8 | SW846 - 8000 series | 0.02 |
| 64 | 1,2,4-Trichlorobenzene | 120-82-1 | SW846 - 8000 series | 2.0 |
| 65 | Hexachlorobutadiene | 87-68-3 | SW846 - 8000 series | 0.2 |
| 66 | Naphthalene | 91-20-3 | SW846 - 8000 series | 5.0 |
| 67 | 1,2,3-Trichlorobenzene | 87-61-6 | SW846 - 8000 series | 2.0 |
| **Section B. Semi-volatile Compounds** | | | | |
| 68 | 1,2-Diphenylhydrazine (as Azobenzene) | 122-66-7 | SW846 - 8000 series | 1.7 |
| 69 | 2,4,5-Trichlorophenol | 95-95-4 | SW846 - 8000 series | 5.0 |
| 70 | 2,4,6-Trichlorophenol | 88-06-2 | SW846 - 8000 series | 1.7 |
| 71 | 2,4-Dichlorophenol | 120-83-2 | SW846 - 8000 series | 1.7 |
| 72 | 2,4-Dimethylphenol | 105-67-9 | SW846 - 8000 series | 2.0 |
| 73 | 2,4-Dinitrophenol | 51-28-5 | SW846 - 8000 series | 12 |
| 74 | 2,4-Dinitrotoluene | 121-14-2 | SW846 - 8000 series | 1.7 |
| 75 | 2,6-Dinitrotoluene | 606-20-2 | SW846 - 8000 series | 1.7 |
| 76 | 2-Chloronaphthalene | 91-59-7 | SW846 - 8000 series | 10 |
| 77 | 2-Chlorophenol | 95-97-8 | SW846 - 8000 series | 2.0 |
| 78 | 2-Methylnaphthalene | 91-57-6 | SW846 - 8000 series | 5.0 |
| 79 | 2-Methylphenol (o-Cresol) | 95-48-7 | SW846 - 8000 series | 5.0 |
| 80 | 2-Nitroaniline | 88-74-4 | SW846 - 8000 series | 5.0 |
| 81 | 2-Nitrophenol | 88-75-5 | SW846 - 8000 series | 5.0 |
| 82 | 3,3'-Dichlorobenzidine | 91-94-1 | SW846 - 8000 series | 4.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 83 | 3-Nitroaniline | 99-09-2 | SW846 - 8000 series | 5.0 |
| 84 | 3&4-Methylphenol (m&p-Cresol) | 106-44-5 | SW846 - 8000 series | 5.0 |
| 85 | 4,6-Dinitro-2-methylphenol | 534-52-1 | SW846 - 8000 series | 12 |
| 86 | 4-Bromophenyl phenylether | 85-68-7 | SW846 - 8000 series | 10 |
| 87 | 4-Chloro-3-methylphenol | 59-50-7 | SW846 - 8000 series | 10 |
| 88 | 4-Chloroaniline | 106-47-8 | SW846 - 800 series | 1.3 |
| 89 | 4-Chlorophenyl phenylether | 7005-72-3 | SW846 - 8000 series | 10 |
| 90 | 4-Nitroaniline | 100-01-6 | SW846 - 8000 series | 5.0 |
| 91 | 4-Nitrophenol | 100-02-7 | SW846 - 8000 series | 12 |
| 92 | Acenaphthene | 83-32-9 | SW846 - 8000 series | 5.0 |
| 93 | Acenaphthylene | 208-96-8 | SW846 - 800 series | 5.0 |
| 94 | Anthracene | 120-12-7 | SW846 - 8000 series | 5.0 |
| 95 | Benzidine | 92-87-5 | SW846 - 8000 series | 12 |
| 96 | Benzo (a) anthracene | 56-55-3 | SW846 - 8000 series | 1.7 |
| 97 | Benzo (a) pyrene | 50-32-8 | SW846 - 8000 series | 1.7 |
| 98 | Benzo (b) fluoranthene | 205-99-2 | SW846 - 8000 series | 5.0 |
| 99 | Benzo (g,h,i) perylene | 191-24-2 | SW846 - 8000 series | 5.0 |
| 100 | Benzo (k) fluoranthene | 207-08-9 | SW846 - 8000 series | 5.0 |
| 101 | Bis (2-chloroethoxy) methane | 111-91-1 | SW846 - 8000 series | 5.0 |
| 102 | Bis (2-chloroethyl) ether | 111-44-4 | SW846 - 8000 series | 1.7 |
| 103 | Bis (2-chloroisopropyl) ether | 39638-32-9 | SW846 - 8000 series | 2.0 |
| 104 | Bis (2-ethylhexyl) phthalate | 117-81-7 | SW846 - 8000 series | 5.0 |
| 105 | Butyl Benzyl phthalate | 85-68-7 | SW846 - 8000 series | 5.0 |
| 106 | Carbazole | 86-74-8 | SW846 - 8000 series | 1.7 |
| 107 | Chrysene | 218-01-9 | SW846 - 8000 series | 5.0 |
| 108 | Di-n-butyl phthalate | 84-74-2 | SW846 - 8000 series | 5.0 |
| 109 | Di-n-octyl phthalate | 117-84-0 | SW846 - 8000 series | 5.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 110 | Dibenzo (a,h) anthracene | 53-70-3 | SW846 - 8000 series | 1.7 |
| 111 | Dibenzofuran | 132-64-9 | SW846 - 8000 series | 5.0 |
| 112 | Diethyl phthalate | 84-66-2 | SW846 - 8000 series | 5.0 |
| 113 | Dimethyl phthalate | 131-11-3 | SW846 - 8000 series | 5.0 |
| 114 | Fluoranthene | 206-44-0 | SW846 - 8000 series | 5.0 |
| 115 | Fluorene | 86-73-7 | SW846 - 8000 series | 5.0 |
| 116 | Hexachlorobenzene | 118-74-1 | SW846 - 8000 series | 1.7 |
| 117 | Hexachlorocyclopentadiene | 77-47-4 | SW846 - 8000 series | 5.0 |
| 118 | Hexachloroethane | 67-72-1 | SW846 - 8000 series | 1.7 |
| 119 | Indeno (1,2,3-cd) pyrene | 193-39-5 | SW846 - 8000 series | 1.7 |
| 120 | Isophorone | 78-59-1 | SW846 - 8000 series | 2 |
| 121 | N-Nitroso-di-n-propylamine | 621-64-7 | SW846 - 8000 series | 2.0 |
| 122 | N-Nitrosodimethylamine | 62-75-9 | SW846 - 8000 series | 4.0 |
| 123 | N-Nitrosodiphenylamine | 86-30-6 | SW846 - 8000 series | 2.0 |
| 124 | Nitrobenzene | 98-95-3 | SW846 - 8000 series | 2.0 |
| 125 | Pentachlorophenol | 87-86-5 | SW846 - 8000 series | 4.0 |
| 126 | Phenanthrene | 85-01-8 | SW846 - 8000 series | 5.0 |
| 127 | Phenol | 108-95-2 | SW846 - 8000 series | 5.0 |
| 128 | Pyrene | 129-00-0 | SW846 - 8000 series | 5.0 |
| **Section C. Metals** | | | | |
| 129 | Total Arsenic | 7440-38-2 | SW846 6000/7000 series | 10 |
| 130 | Total Cadmium | 7440-43-9 | SW846 6000/7000 series | 1.0 |
| 131 | Total Chromium | 16065-83-1 | SW846 6000/7000 series | 10 |
| 132 | Total Copper | 7440-50-8 | SW846 6000/7000 series | 10 |
| 133 | Total Lead | 7439-92-1 | SW846 6000/7000 series | 11 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 134 | Total Mercury | 7439-97-6 | SW846 7000 series | 0.05 |
| 135 | Total Molybdenum | 7439-98-7 | SW846 6000/7000 series | 18 |
| 136 | Total Nickel | 7440-02-0 | SW846 6000/7000 series | 10 |
| 137 | Total Selenium | 7782-49-2 | SW846 6000/7000 series | 18 |
| 138 | Total Zinc | 7440-66-6 | SW846 6000/7000 series | 10 |
| 139 | Total Antimony | 7440-36-0 | SW846 6000/7000 series | 8 |
| 140 | Total Beryllium | 7440-41-7 | SW846 6000/7000 series | 0.1 |
| 141 | Total Silver | 7440-22-4 | SW846 6000/7000 series | 4.0 |
| 142 | Total Thallium | 7440-28-0 | SW846 6000/7000 series | 10 |
| **Section D. Pesticides** | | | | |
| 143 | Aldrin | 309-00-2 | SW846 - 8000 series | 0.09 |
| 144 | Gamma-BHC (Lindane) | 58-89-9 | SW846 - 8000 series | 0.09 |
| 145 | Alpha-BHC | 319-84-6 | SW846 - 8000 series | 0.06 |
| 146 | Delta-BHC | 319-86-8 | SW846 - 8000 series | 0.09 |
| 147 | Beta-BHC | 319-85-7 | SW846 - 8000 series | 0.06 |
| 148 | Chlordane | 57-74-9 | SW846 - 8000 series | 0.8 |
| 149 | 4,4'-DDT | 50-29-3 | SW846 - 8000 series | 0.09 |
| 150 | 4,4'-DDE | 72-55-9 | SW846 - 8000 series | 0.07 |
| 151 | 4,4'-DDD | 72-54-9 | SW846 - 8000 series | 0.07 |
| 152 | Alpha-Endosulfan | 959-98-8 | SW846 - 8000 series | 0.07 |
| 153 | Beta-Endosulfan | 33213-65-9 | SW846 - 8000 series | 0.07 |
| 154 | Endosulfan Sulfate | 1031-07-8 | SW846 - 8000 series | 0.07 |
| 155 | Endrin | 72-20-8 | SW846 - 8000 series | 0.07 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 156 | Endrin Aldehyde | 7421-93-4 | SW846 - 8000 series | 0.07 |
| 157 | Heptachlor | 76-44-8 | SW846 - 8000 series | 0.2 |
| 158 | Heptachlor Epoxide | 1024-57-3 | SW846 - 8000 series | 0.7 |
| 159 | Toxaphene | 8001-35-2 | SW846 - 8000 series | 0.8 |
| **Section E. Polychlorinated Biphenyls** | | | | |
| 160 | PCB-1242 | 53469-21-9 | SW846 - 8000 series | 0.7 |
| 161 | PCB-1254 | 11097-69-1 | SW846 - 8000 series | 0.7 |
| 162 | PCB-1221 | 11104-28-2 | SW846 - 8000 series | 0.7 |
| 163 | PCB-1232 | 11141-16-5 | SW846 - 8000 series | 0.7 |
| 164 | PCB-1248 | 12672-29-6 | SW846 - 8000 series | 0.7 |
| 165 | PCB-1260 | 11096-82-5 | SW846 - 8000 series | 0.7 |
| 166 | PCB-1016 | 12674-11-2 | SW846 - 8000 series | 0.7 |
| **Section F. Additional Analyses** | | | | |
| 167 | pH | na | SM-4500-H | na |
| 168 | Percent solids | na | SM-2540 G | na |
| 169 | nitrate-nitrite | 14797-55-8<br>14797-65-0 | SM-4500-$NO_3$<br>SW846 - 9210<br>EPA 353 -3000 series | 30 |
| 170 | Total Kjeldalh nitrogen | na | SM-4500-$N_{org}$<br>EPA-351.3 | 300 |
| 171 | ammonia nitrogen | na | SM-4500-$NH_3$<br>EPA-350 | 30 |
| 172 | Total organic nitrogen | na | calculation | na |
| 173 | potassium | na | SM-3500-K<br>SW846<br>6000/7000 series | 15 |
| 174 | phosphorus | na | SM-4500-P<br>EPA-365 | 15 |
| **Section G. Dioxins** | | | | |
| 175 | 2,3,7,8 TCDD & 2,3,7,8 TCDF | 1746-01-6 | EPA 1613A | 5ppt TEQ |
| 176 | Remaining congeners of 2,3,7,8 TCDD | 1746-01-6 | EPA 1613A | 5ppt TEQ |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| **Section H. Cyanides** | | | | |
| 177 | Total cyanides | na | SM-4500-CN | 10 |
| **Section I. Enteric Virus** | | | | |
| 178 | Enteric Virus | na | ASTM-Method D 4994-89 | 1 PFU/ 4 grams |

na - not applicable

(e) The following shall apply to Table 807-I:

(1) Except for (2) and (3) below, the detection limit for all the analyses shall be at or below the detection limits specific in Table 807-I;

(2) If the percent solids in a sludge is below 10%, the results shall be reported in mg/L and the detection limits shall be appropriate to the methodology specified in Table 807-I for a water matrix; and

(3) If the detection limit specified in Table 807-I can not be achieved by the methodology listed, the department shall accept such detection limits which are routinely achievable.

(f) The sludge quality certification holder shall analyze the sludge from its treatment facility or facility at the frequencies specified in Table 807-II, below for the parameters listed in Table 807-I section F above and for the metals in Table 807-I section C above except for antimony, beryllium, silver, and thallium, in accordance with the analytical methods and detection limits specified.

Table 807-II
Frequency of Monitoring - Land Application

| Quantity of Sludge (wet tons) | Frequency |
|---|---|
| 0 - 1600 | Once per 180 days |
| 1600 - 8250 | Once per quarter |
| 8250 - 82,600 | Once per 60 days |
| > 82,600 | Once per month |

(g) For the purposes of Table 807-II in (f) above, "quantity of sludge" means the total quantity of sludge generated in a calendar year that is land applied, sold, or given away in bulk.

(h) The sludge quality certification holder shall analyze sludge from its treatment facility or facility every year for the constituents identified below:

(1) Except for section I, enteric viruses, the compounds in Table 807-I analyzed in accordance with the analytical methods and detection limits specified in the table; and

(2) For generators of class B sludge proposing to maintain certification of their sludge for reclamation uses, enteric viruses as specified in Table 807-I, section I in Env-Ws 807.05(d).

(i) Additional testing shall be required by the department when results of testing conducted by the sludge quality certification holder, site permit holder, or the department show that the requirements in Env-Ws 807.03 have not been met.

(j) If additional testing is required under (i) above, the sludge quality certification holder and all site operators that apply the sludge shall cease land application of sludge until the additional testing, performed in accordance with (k) below, demonstrates that the sludge is acceptable for land application according to the standards of Env-Ws 807.03.

(k) The following additional testing shall be done in accordance with the analytical procedures specified above:

(1) Collect and analyze representative samples of sludge from each stockpile at each site which contains the generator's sludge for the constituent(s) of concern and submit results to the department for review and approval prior to land applying their sludge;

(2) Increase the frequency of testing at the generator's facility for that compound(s) of concern to weekly; continue the weekly sampling until 4 successive weeks show that the concentration of the constituent(s) of concern meets the standards in Env-Ws 807.03, as determined by the department; and

(3) After complying with (2) above, resume land application and increase sampling frequency specified in Env-Ws 807.05 to monthly for the constituent(s) of concern for 6 months.

(l) The department shall reduce the number of constituents required to be tested annually if it determines, based on all available information, that the constituent(s) is not present in the sludge.

Env-Ws 807.06 Reporting.

(a) Every sludge quality certification holder shall submit an annual report by the last business day of January following the issuance of the certificate which contains the following information:

(1) The name and address of the treatment facility which generated the sludge;

(2) Name and telephone number of the operator of the facility;

(3) The sludge quality certificate number;

(4) The quantity of sludge generated, in wet and dry tons;

(5) The results of all testing required by the department and EPA during the previous year including laboratory results presented categorically as required in Env-Ws 807.01(h)(3);

(6) The name, location, and amount, in wet and dry tons, where the sludge was delivered; and

(7) The proposed updated label as required under Env-Ws 810.02, if applicable.

## PART Env-Ws 808 FACILITY PERMIT REQUIREMENTS

Env-Ws 808.01 Facility Permit Applications.

(a) The person proposing to undertake the sludge management activities at the facility shall apply for the facility permit.

(b) The applicant for a facility permit shall provide the following information on a form obtained from the department:

(1) The name, address, and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone number of the applicant's business;

(3) The name and telephone number of the person who can be reached 24 hours a day in case of an emergency;

(4) The location of the proposed facility, including street address, tax map and lot number, and current deed reference;

(5) The name(s), mailing address(es), and telephone number(s) of each operator of the facility including each person's responsibility as it pertains to the regulated activities;

(6) The types of sludge management activities being proposed at the facility, including but not limited to, composting, processing, stockpiling, or treating;

(7) A description of the intended capacity and life of the facility;

(8) A history of the use of the land on which the facility is proposed covering 5 years immediately prior to submission of the application; and

(9) The intended use of the sludge generated and whether sludge quality certification will be sought.

(c) The following shall be submitted with the application:

(1) If applicable, facility plans and specifications for construction and closure stamped by a professional engineer registered in the State of New Hampshire;

(2) The facility plan prepared in accordance with Env-Ws 808.06;

(3) The management plan prepared in accordance with Env-Ws 808.07;

(4) A statement signed by the applicant certifying that:

a. The notification provisions of Env-Ws 803.01 have been complied with;

b. All operators of the facility have been instructed on the requirements of Env-Ws 800 or shall be instructed prior to working at the facility;

c. A copy of the application has been given to the governing body of the municipality in which the activity is proposed to occur; and

d. The information submitted is accurate;

(5) The description of the soil profile characteristics of each test pit or auger boring;

(6) Written verification from the department of resources and economic development indicating whether or not a threatened or endangered species exist on the site;

(7) For sludge monofills, financial assurance shall be provided in accordance with the requirements of Env-Wm 3100 of the solid waste rules;

(8) A copy of the facility closure plan as specified in Env-Ws 808.09;

(9) A list and copies of all other state permits which are required for the proposed facility and evidence that applications for those permits have been submitted;

(10) The name and address of the locally accessible place where all the information required in Env-Ws 808.01 can be reviewed;

(11) Whether the applicant has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application;

(12) A copy of the Natural Resource Conservation Service county soils map, or portion thereof, with the area(s) of proposed activity clearly delineated, including a description of each soil type found on the site;

(13) The description of the soil profile characteristics of each soil test pit or auger

boring as required in Env-Ws 808.10(c); and

(14) An original of the most recent USGS map, largest scale available, with the latitude and longitude, showing the approximate location and boundaries of the facility.

(d) If the applicant is not the owner, the application shall be accompanied by a written statement in accordance with (e) below, and signed by the owner.

(e) The written statement shall say that the owner is aware that the application is being filed and has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the facility in the event that the department issues the permit.

(f) If the applicant is not the generator of the sludge(s), the application shall be accompanied by a written statement signed by each generator stating that the generator is ultimately responsible for ensuring that the final disposition of the material is performed in accordance with these rules and 40 CFR part 503.

(g) Each application shall be:

(1) Signed by the applicant;

(2) Submitted in duplicate; and

(3) Accompanied by the fee specified in Env-Ws 808.04.

Env-Ws 808.02 Expiration of Facility Permits.

(a) A facility permit issued by the department shall expire 5 years from the date on which it was issued.

(b) Any person operating a facility prior to the effective date of the 1999 amendments to Env-Ws 800 without a valid permit pursuant to Env-Ws 800 shall:

(1) Within 90 days from the effective date of the 1999 amendments to Env-Ws 800, comply with all applicable provisions of Env-Ws 800, other than notification and permitting requirements;

(2) Within 90 days of the effective date of the 1999 amendments to Env-Ws 800, submit facility plans, management plans, contingency plans, and closure plans; and

(3) Within 180 days of the effective date of the 1999 amendments to Env-Ws 800, submit a permit application.

(c) If a permit is denied, all sludge management activities shall cease and all material shall be removed from the facility and the facility shall be closed in accordance with Env-Ws 808.09.

Env-Ws 808.03 Renewal of Facility Permits. Any person to whom a facility permit has been issued, and who wishes to renew the permit, shall apply for a permit modification under Env-Ws 804.08(b) and submit the permit fee required by Env-Ws 808.04 to the department no later than 180 days prior to expiration of the permit.

Env-Ws 808.04 Permit Fees.

(a) A fee in the amount of $500 shall accompany each application for issuance or renewal of a facility permit to compost sludge.

(b) A fee in the amount of $1,000 shall accompany each application for issuance or renewal of a facility permit to mix, treat, process, or dispose of sludge other than for sludge composting.

(c) Any New Hampshire municipality that applies for a facility permit or has its sludge managed at a facility shall be exempt from the fees specified in (a) and (b) above.

(d) Fees, if paid by check or money order, shall be made payable to "Treasurer-State of NH."

Env-Ws 808.05 Criteria for Review. The department shall issue or renew a facility permit if it determines that the following criteria have been met:

(a) All applicable requirements of the rules have been met;

(b) All state permits which are necessary for the construction and operation of the facility have been applied for;

(c) Management of sludge at the facility, in accordance with the application, shall not violate any statues or rules implemented by the department;

(d) The permit holder has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application;

(e) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department; and

(f) The sludge management activities which will be conducted at the facility shall not adversely affect threatened or endangered species.

Env-Ws 808.06 Facility Plans. Facility plans required under Env-Ws 808.01(c)(2) shall be at a scale appropriate to show all information contained on the plan clearly and include the following:

(a) A locus map which identifies the proposed facility location and details the proposed route of access to the site;

(b) The total available land area, in acres, and the specific acres to be used for facility

operations, including proposed stockpile or storage tank locations;

(c) The identification of access roads and access control measures, including perimeter fencing and buffer distances;

(d) The identification of roads, property lines, structures whether on or off the property, and any easements or rights-of-way which exist on the property;

(e) The identification of proposed measures to control surface runoff to or from the facility and stockpile locations, if applicable;

(f) The identification of surrounding land use within 500 feet;

(g) All soil test pit and auger boring locations;

(h) The approximate location of and distance to all dwellings, structures, and water supply wells within 500 feet of the facility;

(i) The names and addresses of all abutters;

(j) The name and location of all surface waters within 500 feet of the facility, including their designated river classification under RSA 483, New Hampshire rivers management and protection program, if applicable;

(k) The scale of the plan;

(l) An arrow indicating which direction on the plan is north;

(m) The location of all poorly and very poorly drained soils; and

(n) If applicable, the location of the items required in Env-Ws 809.02(b).

Env-Ws 808.07 Management Plans. Management plans required under Env-Ws 808.01(c)(3) shall include the following:

(a) The normal hours of operation of the site;

(b) Storage or stockpiling provisions, if applicable;

(c) The name of the generator(s) and its corresponding sludge quality certification numbers, if applicable;

(d) The quantity of sludge, in wet and dry tons, expected on a periodic basis, such as daily, weekly or monthly;

(e) The quantity of sludge, in wet and dry tons, expected over the entire life expectancy of the facility, if applicable;

(f) Additional on-site measures to be taken to control vectors;

(g) A detailed odor control plan explaining:

(1) The procedures that shall be used to address and resolve any odor complaints;

(2) Additional management techniques employed to minimize odors; and

(3) The name, address, and telephone number of the person(s) who shall be responsible for responding to odor complaints; and

(h) A copy of the facility contingency plan describing course(s) of action to be followed in case of emergency or other special conditions, such as:

(1) Equipment breakdowns;

(2) Fire;

(3) Vectors;

(4) Explosion;

(5) Spills;

(6) Receipt or release of hazardous or toxic materials or substances;

(7) Groundwater, surface water, or air contamination attributable to a facility; and

(8) Other incidents that could threaten human health or safety, or the environment.

Env-Ws 808.08 Facility Standards.

(a) New facilities for the treatment or processing of sludge, such as sludge treatment facilities and sludge lagoons, shall be designed and constructed in accordance with the requirements of the "Guides for the Design of Wastewater Treatment Works" by the New England Interstate Water Pollution Control Commission, dated 1998.

(b) Sludge composting facilities and sludge monofills shall be designed, constructed, operated and closed in accordance with the requirements of Env-Wm 2300 and Env-Wm 2500, respectively, of the solid waste rules.

(c) All facilities shall:

(1) Be operated in such a manner so as to minimize the impact on abutters and the surrounding community;

(2) Be posted with signs which:

a. Contain the name and telephone number of the operator;

b. State "This is a Sludge Management Area";

c. Are printed with block letters no less than 2 inches in height, and with the name and address of the owner or lessee of the property; and

d. Are no more than 100 yards apart on all sides and shall also be posted at gates, bars, and commonly used entrances;

(3) Restrict access by the installation of a locked gate or cable;

(4) Be operated such that odors from the facility are minimized;

(5) Be maintained in a clean and orderly fashion to minimize attraction of vectors; and

(6) Be closed in accordance with Env-Ws 808.09.

(d) In addition to the requirements in (c) above, all lagoons shall be:

(1) Fenced around the perimeter to control access;

(2) Maintained to provide a minimum of 2 feet of freeboard at all times; and

(3) Bermed on all sides to divert surface drainage away from the lagoons.

(e) Subject to (g) below, no person shall site or operate a facility within the buffer distances specified in Table 808-I:

Table 808-I
Buffer Distances (in feet)

For Processing, Stockpiling or Storage Facilities

| | |
|---|---|
| Nearest Well | 500[a] |
| Surface Water | 250 |
| Surface Drinking Water Source | 500 |
| Nearest Occupied Dwelling | 500[b] |
| Property Line | 500[b] |
| Groundwater Depth | 4 |
| Bedrock / Restrictive Layer | 4 |

(f) The following shall apply to Table 808-I:

(1) The letter "a" shall indicate that the distance to the nearest well shall be as far as practical, but in no case closer than 500 feet; and

(2) The letter "b" shall indicate that the distance to the nearest occupied dwelling or property line shall be as far as practical beyond 500 feet, but may be reduced below 500 feet with the occupant's prior written consent.

(g) Facilities which are in operation prior to the effective date of the 1999 amendments to Env-Ws 800 shall comply with the buffer distances, identified in Table 808-I, within 90 days, as applicable.

Env-Ws 808.09 Closure Plans.

(a) All sludge facilities that have not closed as of the effective date of the 1999 amendments to Env-Ws 800 shall submit a closure plan to the department within 120 days of such effective date.

(b) The closure plan shall include the following:

(1) The facility identification, including name, mailing address, location, and permit number, if applicable;

(2) A description of the procedures for removing all material from the facility, if applicable, and the intended final disposition of the materials;

(3) A description of any proposed site work that will be performed to regrade and or revegetate the area;

(4) The schedule of closure activities and anticipated closure date; and

(5) A description of how notification shall be given to all users of the facility of the termination of operation of the facility.

(c) At least 60 days prior to the planned cessation of facility operations, the permittee shall provide the department and the municipality in which the facility is located, with written notice of

the intent to close the facility.

(d) The notice shall include the following:

(1) The facility identification, including permit number;

(2) The date the facility intends to stop receiving and/or processing sludge;

(3) A copy of the facility's approved closure plan or file reference thereto; and

(4) The date the facility intends to begin closure activities and estimated closure completion date.

(e) The permittee shall notify the department and the municipality in which the facility is located when closure is complete.

Env-Ws 808.10 Testing.

(a) One soil test pit or auger boring shall be taken, at a depth of at least 40 inches, for each soil mapping unit present on the Natural Resource Conservation Service county soils map, but no less than one every 5 acres.

(b) One soil test or auger boring shall be taken, at a depth of at least 6 feet, for each area proposed for storage.

(c) An analysis of the soil test pits or auger borings shown in (b) and (c) above shall be performed and shall include a description of the soil profile characteristics, depth to the seasonal high water table, bedrock, or other restrictive layer.

Env-Ws 808.11 Record keeping.

(a) Every facility permit holder shall maintain records of each load of sludge received at the facility, including identification of:

(1) The date received;

(2) The hauler delivering the load;

(3) The quantity of each load of sludge received by the generator, in wet tons and percent solids; and

(4) The sludge quality certification number.

(b) Facility plans, management plans, closure plans, and records shall be maintained by the permit holder, and shall be available to the department for review during business hours. If the department believes that violations of RSA 485-A or these rules relative to sludge management have

occurred, the department shall require the permit holder to submit copies of all records.

(c) Facility plans, management plans, closure plans, and records shall be maintained for a minimum of 5 years after closure of the facility.

Env-Ws 808.12 Reporting.

(a) The permit holder shall report all complaints. Information shall be provided to the department orally within 24 hours of receipt of a complaint. A written submission shall be provided within 5 days of the complaint and shall contain a description of the complaint, including exact dates, times, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the concern.

(b) Every facility permit holder shall submit an annual report for each facility to the department by the last business day of January for each calendar year in which the permit is valid, regardless of whether or not the facility received or processed sludge during the previous calendar year.

(c) The annual report shall contain the following information:

(1) The name and address of the facility;

(2) The permit number;

(3) The name of the permit holder;

(4) The total quantity of sludge, in wet and dry tons, received at the facility from each generator and their sludge quality certification number; and

(5) The quantity of all material distributed, in wet and dry tons.

(d) If any of the information differs from that previously supplied to the department concerning the activity, the permit holder shall note those differences in the annual report.

## PART Env-Ws 809 GROUNDWATER MONITORING

Env-Ws 809.01 Applicability. Groundwater shall be monitored at the following:

(a) Sludge monofills;

(b) Sludge lagoons;

(c) Reclamation sites; and

(d) Those sludge management activities conducted at facilities, such as outside sludge stockpiles or compost piles containing leachable constituents, which, if not properly managed, might result in contamination of groundwater.

Env-Ws 809.02 Groundwater Monitoring Plan Requirements.

(a) The applicant shall submit a groundwater monitoring plan which includes:

(1) The constituents to be monitored;

(2) The location and identification of all sampling points;

(3) The sampling frequency;

(4) The sampling methodologies;

(5) The analytical methodologies; and

(6) The procedures that shall be used to establish background concentrations of all constituents required for monitoring. "Background concentrations" means concentrations detected in areas unaffected by the site or facility permitted or to be permitted.

(b) In addition to (a) above, the applicant shall include the following on the site or facility plan prepared in accordance with Env-Ws 806.06 and Env-Ws 808.06, respectively:

(1) The location, elevation, and datum of a bench mark, if a survey is conducted to establish topography;

(2) Ground surface spot elevations and contours to show topography, using information from the most recent USGS map, or more accurate information, if available;

(3) The identification and location of the existing and proposed groundwater monitoring wells, showing at least one hydraulically up gradient and 2 hydraulically down gradient wells;

(4) The identification and location of any surface water sampling points;

(5) Groundwater contours which accurately show groundwater flow direction;

(6) A description of the method used to develop groundwater contours, including the identification and location of any piezometers;

(7) A table of water level measurements and elevations found in any piezometers and monitoring wells used to develop the groundwater contours;

(8) Well construction details of any existing monitoring wells, top of well casing elevations, and measured depth to water table from top of casing; and

(9) Well construction details of any proposed monitoring wells.

Env-Ws 809.03 Corrective Action Plan.

(a) If the concentration of any constituent required by the department to be monitored under the groundwater monitoring plan exceeds the background value, in accordance with (b) below, at any down gradient monitoring well, the permit holder shall notify the department within 10 days and shall commence monthly monitoring for each constituent, and at each well where background has been exceeded, monthly monitoring shall continue until the results demonstrate that background has not been exceeded for 2 consecutive months.

(b) Background shall be deemed to be exceeded when any of the following conditions exist:

(1) The concentration of a monitored constituent exceeds the background concentration, as established in Env-Ws 809.02(a)(6), by more than the analytical detection limit for that constituent;

(2) The concentration of a monitored constituent previously undetected using the procedures established in Env-Ws 809.02(a)(6) exceeds the analytical detection limit by a factor of 1.5; or

(3) For nitrate monitored at reclamation sites, the concentration exceeds 5 mg/L above the background nitrate concentration or 9 mg/L, whichever is less.

(c) If the concentration of the constituent(s) detected by the additional monitoring exceeds the background concentration for 2 consecutive months, but is below the ambient groundwater quality standard, the permit holder shall:

(1) Notify the department within 10 days;

(2) For reclamation sites, cease operation;

(3) Continue monthly monitoring; and

(4) Within 30 days submit to the department for review and approval a corrective action plan which shall describe the exceedances, the source(s) of the exceedances and the proposed measures to be taken to eliminate the exceedances.

(d) The department shall approve the corrective action plan if it determines that the action shall:

(1) Achieve compliance with background and ambient groundwater quality standards;

(2) Eliminate any future discharges of the constituent(s) that was causing the exceedances of background values to the groundwater; and

(3) Protect human health and the environment.

(e) The corrective action shall be initiated within 30 days of department approval and

implemented in accordance with an approved implementation schedule.

(f) If the concentrations of any monitored constituent detected by any required monitoring are above the ambient groundwater quality standard, the permit holder shall:

(1) Cease operation;

(2) Notify the department within 10 days; and

(3) Apply for a groundwater management permit.

Env-Ws 809.04 Water Quality Sampling, Analysis, and Reporting.

(a) Analyses shall be performed by a laboratory certified by the USEPA or the New Hampshire department of environmental services pursuant to Env-C 300.

(b) Sampling shall be performed in accordance with:

(1) Sampling procedures and protocol described in "Practical Guide for Ground-Water Sampling," document identification number EPA/600/2-85/104, USEPA; and

(2) "RCRA Ground-Water Monitoring Enforcement Guidance," document identification number PB87107751, USEPA.

(c) The results of all regularly scheduled testing shall be summarized and submitted with the annual report.

Env-Ws 809.05 Groundwater Monitoring Wells.

(a) Unless alternative methods, which are equivalent to (1) and (2) below, are approved by the department, monitoring wells shall be designed, installed, and decommissioned in accordance with the practices described in:

(1) "Standard Practices for Design and Installation of Ground Water Monitoring Wells in Aquifers," American Society for Testing and Materials, Designation: D 5092 - 90, approved June 29, 1990, and published October 1990, readopted - 1995; and

(2) "Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells," document identification number EPA/600/4-89/034, USEPA, March 1991.

(b) Monitoring wells shall be:

(1) Developed prior to sampling; and

(2) Allowed to equilibrate a minimum of 2 weeks prior to sampling.

## PART Env-Ws 810 REQUIREMENTS FOR CLASS A SLUDGE

Env-Ws 810.01 Requirements for Land Application.

(a) All persons who land apply class A sludge shall comply with the following:

(1) If the sludge is not certified as low-metals sludge under Env-Ws 807.03, the application rate shall not exceed the annual application limits stated on the label required under Env-Ws 810.02; and

(2) Sludge shall not be applied within 35 feet of surface water.

(b) In addition to (a) above, all persons who land apply class A sludge on a contiguous area of more than 5 acres shall:

(1) Obtain and follow the nutrient recommendation from UNH cooperative extension, USDA, NH department of agriculture, NRCS, or other certified agricultural or crop advisors, for the application area; and

(2) Maintain sludge stockpiles to minimize the amount of water running on, off, or through the stockpile.

Env-Ws 810.02 Label Requirements.

(a) The generator of class A sludge shall submit to the department with the application for a sludge quality certification, and annually with the annual report required under Env-Ws 807.06, a proposed label.

(b) The proposed label shall include the following:

(1) The name, address, and telephone number of the generator;

(2) A brief description of the product, including the process employed to treat or stabilize the sludge;

(3) Recommended uses and appropriate application rates;

(4) Average nutrient analysis for nitrogen, phosphorus, and potassium based upon the analytical results required under Env-Ws 807.05(e) from the previous year; and

(5) Average metals concentration for the 10 metals listed in Env-Ws 807.03(c) based upon the analytical results required under Env-Ws 807.05(e) from the previous year.

(c) The department shall approve the label within 30 days of receipt, if it determines that the information in the proposed label is complete and correct.

Env-Ws 810.03 Record keeping. The generator shall record the name and address of all persons receiving at one time more than 20 cubic yards of sludge.

## PART Env-Ws 811 REQUIREMENTS FOR WAIVERS

Env-Ws 811.01 Requirements for Waivers.

(a) The rules contained in this part are intended to apply to a variety of conditions and circumstances. It is recognized that strict compliance with all rules might not fit every conceivable situation.

(b) Requests for waivers shall be submitted in writing to the department.

(c) Requests for waivers shall include the following information:

(1) The name, address, and telephone number of the person requesting the waiver;

(2) The permit or sludge quality certification to which the waiver request relates, and its permit or certification number, if applicable;

(3) A specific reference to the section of the rule for which a waiver is being sought and an explanation of why a waiver is necessary;

(4) An explanation of the alternatives for which a waiver is sought, with supporting data; and

(5) A full explanation of how the alternatives for which a waiver sought:

a. Are consistent with the intent of RSA 485-A and RSA 485-C; and

b. Would provide an equivalent level of protection of human health and the environment.

(d) The department shall approve a request for a waiver upon finding that:

(1) The alternatives proposed are at least equivalent to the requirements contained in these rules;

(2) They are adequate to ensure that the provisions of RSA 485-A and RSA 485-C are met; and

(3) Human health, safety, and the environment shall be protected.

(e) No waiver shall be granted which, in the judgment of the department, contravenes the intent of any statute or rule.

(f) The department shall issue a written response to a request for a waiver within 90 days of receipt of the request.

SB 218 Attachment D

# Warner Village Water District

P.O. Box 252
55 West Joppa Rd.
Warner, N.H. 03278

Office of Commissioners Tel. (603) 456-3890

March 29, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 102
Concord, NH 03301

RE: SB218 Regulating the Land Application of Sewage Sludge

Dear Chairman Russman:

The Warner Village Water District (District) services its 200 customers with both water and wastewater. The water system, which consists of two wells is simple, efficient, and was constructed through Community Development Block Grants. The cost of operation and maintenance is slightly higher than New Hampshire's yearly average customer cost for water, at approximately $254.00 per year per customer. The wastewater system is more complex, was constructed with EPA monies, and costs more to operate and maintain. The yearly cost to our customers is approximately $675.00, fifth highest in New Hampshire. Our customers pay an average of $925.00 for the privilege of drinking safe water, and having their wastewater treated in an approved environmentally sound manner.

Like most other wastewater treatment plants in New Hampshire, the District's wastewater treatment plant produces an end product: Biosolids. However, unlike most other wastewater treatment plants, we currently have the option to treat our Biosolids on site for upwards of 10 years, through the use of reed beds. At the end of 10 years, the reed beds must be stripped of their contents and replanted for another cycle. The Biosolids, which have been composted through these 10 years, are tested for contaminants, lime stabilized and then land applied, within the Town of Warner. The current costs associated with this method of treatment average approximately $1,200.00 per year for the 10 years. These costs are included in the above $675.00 average yearly customer sewage rate.

The District's wastewater treatment plant produces 180,000 gallons of 2% Biosolids on a yearly basis. If the District were not able to use our

current Biosolids treatment method, the next least costly method would be trucking of this material to the Concord, NH, wastewater treatment facility. Transportation, Biosolids treatment and testing would cost $21,300.00 per year. This would add $130.00 per year to the sewage rate of $675.00, which equals $805.00, a 14.3% increase.

If SB218 were passed, and we were not able to use our reed beds, nor land apply Biosolids to acreage in Warner, and the Concord wastewater treatment facility was not able to receive our Biosolids, our costs for Biosolids would increase dramatically. The District would have to transport the 180,000 gallons of 2% Biosolids out-of-state. The calculated transportation, Biosolids treatment and testing costs would be $42,500.00 per year. This would add $212.50 per year to the sewage rate of $675.00, which equals $887.50, a 31.5% increase.

The District's Biosolids have passed the NHDES Sludge Quality Certification and are rated Class B in accordance with the current NHDES Sludge Rules. If you and the Senate choose to pass SB218, this action will effectively quash the District's efforts to keep Biosolids treatment and disposal an affordable option for its customers.

Sincerely,

James A. Bailey
Superintendent, WVWD

JAB/jab
Cc: Commissioners, floppy file

Attachment E

April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, NH 03301

**RE: SB 218 - Inexpedient to legislate**

Dear Chairman Russman:

For the record, my name is Erick Sawtelle and I farm fields in Dover, Madbury, Barrington, Durham, Lee, Newmarket, Newfields, and Epping, New Hampshire. We manage over 680 acres and produce feed for 450 head of dairy and beef cattle. I have utilized biosolids since 1993 as part of my nutrient management program.

***As a full-time farmer I urge the committee to vote inexpedient to legislate on SB 218.***

Most of the language in this bill is redundant to the existing Env-Ws 800 Sludge Management Rules recently revised by the NH Department of Environmental Services. There does not seem to be any good reason to address such issues by statute when regulation has already been adopted to address biosolids utilization.

One area that exemplifies the myriad problems with SB 218 as written is the issue of stockpiling as specified in the proposed language of paragraph 2.VIII which limits stockpiling "*up to and including thirty days before any planting or seeding*". This single provision will eliminate stockpiling for the other eleven months of the year. We currently stockpile for 4 – 6 months in advance of planting or seeding in order to get enough biosolids to meet the crop needs. If SB 218 passes, I will not be able to effectively use biosolids to fertilize my crops. Also, w*hat will be done with the biosolids for these other eleven months?*

As a sponsor of this bill, my Senator [Katherine Wheeler] does not represent my views on the beneficial use of biosolids as a recyclable resource. For this and many other reasons, which I would be happy to expound upon in greater detail, **I urge the committee to vote inexpedient to legislate on SB 218.**

I am happy to speak with any committee members about biosolids use on my farm. We hope to be spreading biosolids in mid-May and you are invited to come and see first-hand how this resource benefits my land and nutrient management program.

Sincerely,

Erick Sawtelle

Erick Sawtelle
Pinewoods Yankee Farm
288 Lee Hook Road
Durham, NH 03824
603.659.8106

SB 218

Attachment E

April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, NH 03301

**RE: SB 218 - Inexpedient to legislate**

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Sincerely,

Erick Sawtelle

Erick Sawtelle
Pinewoods Yankee Farm
288 Lee Hook Road
Durham, NH 03824
603.659.8106

218-FN-LOCAL Attachment F

**CLF** Conservation Law Foundation

March 31, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building
Room 104
Concord, New Hampshire 03301

**Re: SB 218-FN-L, An Act relative to the land application of sewage sludge**

Dear Chairman Russman and Members of the Senate Environment Committee:

Conservation Law Foundation ("CLF") appreciates the opportunity to comment on SB 218-FN-L, pertaining to the land application of sludge. CLF is a non-profit, member-supported organization which works to solve the environmental problems that threaten the natural resources and communities of New England. As part of its mission, CLF has a strong interest in the responsible management of solid wastes in New Hampshire. Specifically, CLF is concerned with the use of sludge and biosolids for land-application purposes and in particular circumstances such as the reclamation of gravel operations.

CLF generally advocates a cautious approach relating to the use of sludge for land application purposes. CLF's position is premised on the fact that there remain numerous scientific questions pertaining to the environmental and public health effects of land-applying sludge. In September of 1998, the University of New Hampshire Cooperative Extension published a report entitled Landspreading of Sludge in New Hampshire: Report of the UNH Sludge Task Force ("Task Force Report") (appended hereto). The Task Force Report, which resulted from the work of several UNH researchers and faculty experts, raises the following concerns regarding land-application of sludge:

- There is a potential for organic compounds and excessive nitrates to contaminate surface waters and groundwater;

27 North Main Street, Concord, New Hampshire 03301-4930 • (603) 225-3060 • Fax: (603) 225-3059 • Web: www.clf.org
120 Tillson Avenue, Rockland, Maine 04841-3416 • (207) 596-5900 • Fax: (207) 596-7706
62 Summer Street, Boston, Massachusetts 02110-1016 • (617) 350-0990 • Fax: (617) 350-0990
21 East State Street, Montpelier, Vermont 05602-3010 • (802) 223-5992 • Fax: (802) 223-0060

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- There are uncertainties regarding the behavior of metals in ecosystems which warrant further research;
- There is a need for further research regarding the manner in which metals may pair up (complex) with other elements and compounds, and the effect of such speciation on the mobility of metals in soil, and on water quality;
- There is a need for long-term studies of the metals in sludge when land applied, particularly when agricultural lands are abandoned and the pH is not maintained;
- Recent evidence suggests that certain organic compounds which may be contained in sludge may possess estrogen-mimicking properties which could be harmful to humans and animals;
- Additional research is needed regarding the presence, behavior and health effects of organochlorine pesticides, polychlorinated biphenyls (PCBs), dioxins, furans and other persistent trace organic contaminants which can be present in some sludge;
- Further investigation may be warranted regarding the presence of radioactive material in sludge, particularly where potential sources of discharge to sewage treatment plants include hospitals or other facilities where radioactive materials are present;
- Additional research and testing is needed to resolve uncertainties regarding the potential for pathogenic viruses to migrate into groundwater, and for Cryptosporidium and other intestinal parasites to be present in sludge;
- Trace minerals which can be found in sludge can adversely affect ruminant animals;
- There are concerns among some scientists regarding the health impacts that even relatively low levels of metals can have on the health of animals;
- The potential exists for contaminants such as PCBs, dioxins and pesticides to accumulate in meat and dairy products;
- There is a need for greater sampling and testing of forages and animals to determine the long-term impacts of sludge;
- Little is known about the impact on wildlife grazing on sludge-amended land, and the potential health effects for humans consuming such wildlife.
- Scientific uncertainties remain regarding the long-term soil productivity of sludge-amended land, and the ecological affects of sludge application.

The numerous scientific uncertainties identified in the Task Force Report warrant a very cautious approach with respect to the characteristics of sludge to be land-applied in New Hampshire, as well as the locations and manner of such application.

With specific regard to <u>locations</u> at which sludge is land-applied, CLF is particularly concerned with the use of sludge (including Class A sewage sludge) for reclamation of gravel pits. Because gravel pits are located over aquifers, several of the above-stated concerns raised in the Task Force Report are especially pertinent to the use of sludge for reclamation purposes, namely (1) the potential for organic compounds and

excessive nitrates to contaminate surface waters and groundwater; (2) uncertainties regarding the behavior of metals in ecosystems; (3) uncertainties regarding the manner in which metals may pair up, and the mobility and effects on water quality of complexed metals; and (4) the potential for pathogenic viruses to migrate into groundwater, and for certain intestinal parasites to be present in sludge. A 1997 working paper published by the Cornell Waste Management Institute, entitled "The Case for Caution," and appended hereto, also raises pertinent concerns about sewage sludge. With specific regard to industrial paper mill sludge, CLF is particularly concerned about the potential for dioxin to impact underlying groundwater resources.

To further compound the concerns and lack of scientific data surrounding the issue of sludge for reclamation purposes, it is important to note that current extractive operations in New Hampshire are not conducted in a manner which provides information necessary to evaluate groundwater conditions and soil chemistry. For the most part, excavation operations are for-profit ventures whose knowledge, based on soil borings, are limited primarily to the economic reserves (value) of the materials being mined. Generally, there is no consideration of the long-term groundwater conditions at a site during the reserve analysis, nor are there regulatory provisions that require this information. Although the New Hampshire Department of Environmental Services' rules require the use of monitoring wells after a reclamation operation using sludge has commenced, such monitoring will not prevent contamination of the underlying aquifer, but will only recognize when it has occurred. Moreover, as recognized in the Task Force Report, there are scientific concerns regarding the long-term soil productivity of sludge-amended land. Accordingly, the benefits of using sludge for reclamation purposes are questionable.

In summary, sand and gravel deposits, by their geologic nature, are potential groundwater aquifers. The quality of groundwater resources in these aquifers must be protected during extraction and reclamation activities. Use of sludge for the reclamation of these environmentally sensitive sites is neither prudent nor acceptable based on the current level of understanding and the lack of data at existing sites. Accordingly, CLF supports language in the March 25,1999 amendment to SB 218-FN-L prohibiting the use of Class B sewage sludge and industrial paper mill sludge for reclamation of spent gravel

pits. CLF urges the Committee, however, to further amend SB 218-FN-L to also prohibit the use of Class A sewage sludge for reclamation purposes.

Respectfully submitted,

Conservation Law Foundation
27 North Main Street
Concord, NH 03301
(603) 225-3060

By: _____
Nancy L. Girard, Director
CLF New Hampshire Advocacy Center

By: _____
Thomas F. Irwin, Staff Attorney
CLF New Hampshire Advocacy Center

Encl.

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Attachment G 218 - FN-L

**TOWN OF LITTLETON**
Town Offices Two Union Street Littleton, N.H. 03561
Telephone: (603) 444-3996 Fax: (603) 444-1703

April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Rm 102
Concord, NH 03301

Subject: SB 218, Regulating the Land Application of Sewage Sludge

Dear Chairman Russman:

The Town of Littleton currently utilizes land application of sludge (class B) as a method of disposal for the sludge generated at the wastewater treatment facility. In addition, many small communities surrounding Littleton rely on the Littleton Wastewater Treatment Facility for the disposal of septage generated in their community. As proposed, SB 218 would severely restrict the land deemed suitable for application of sludge. Reuse and recycling of all materials is vitally important to not only protection of the environment, but also to maintain a financially viable Wastewater Treatment option for the community.

We believe the new Sludge Management rules developed by NHDES Env-Ws 800 are sufficiently protective of public health and the environment and trust that NHDES will continue improving the rules as additional scientific evidence warrants.

The Town of Littleton can not support a bill that puts an additional burden on our taxpayers. As proposed SB 218 will significantly increase the costs of disposal of the sludge generated at the Wastewater Treatment Facility.

The Town of Littleton does not support SB 218, which will essentially ban the land application of sludge. We would ask that you consider voting SB 218 inexpedient to legislate.

Thank you for your consideration.

Sincerely yours,

Donald R. Jutton
Town Manager

218 FNL
Attachment H

MICHAEL J. BOBINSKY
Director of Community Services

288 Central Avenue
Dover, New Hampshire 03820-4169
Tel: (603) 743-6072
Fax: (603) 743-6074
E-Mail: michael.bobinsky@ci.dover.nh.us

April 1, 1999

# City of Dover, New Hampshire

## COMMUNITY SERVICES DEPARTMENT

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, New Hampshire 03301

Re: SB 218

Dear Chairman Russman:

The City of Dover is strongly opposed to SB 218 regulating the land application of sewage sludge. As we understand the proposed legislation, this bill will prohibit the ability for the City of Dover to successfully market and recycle our composted sludge. The City of Dover's WWTP produces a Class "A" Bio-Solids and due to its high quality, have been able to successful secure contracts with vendors who compensate the City for the product. Dover produces approximately 12,000 cubic yards of product per year and allows local residents free access to the product for landscaping purposes. Interestingly enough, the City generates approximately $8,000 per year in revenue from the sale of our Bio-Solids. This bill, if passed, would convert a revenue generator into an expense item in the $280,000 per year range. To that end, the City views this as an unfunded mandate and therefore in violation of NH Constitution Part 1, Article 28-a.

Other reasons for the Senate Committee to reject this proposed legislation, include the following:

1. Many of the notification requirements, regulatory standards and management practices are already addressed in existing NHDES Sludge Management Rules, which the City of Dover strictly follows.

2. The City of Dover's WWTP sludge composting operation has been a leader in the field of beneficial use of biosolids in the State. Our quality control and management practices have resulted in our product being sought after by private contractors, municipal staff and local residents. It is outrageous to imaging that a time when the State and our Region is concerned over future landfill space, that we would create state mandates which would eliminate this successful recycling effort and force this product into our regional and local landfills at considerable expense. Based on our production of approximately 4,000 wet tons of sludge per year, the disposal cost to the City, (assuming the availability of landfill access at $70 per ton), would be $280,000. The City of Dover has not budgeted for this, and would necessitate increasing our sewer rates to our customers to cover these new expenses.

3. The City of Dover is most concerned over environmental issues and shares the Committee's interests with protecting the environment. However, the Bill, as drafted appears to be vague and provides no scientific basis for added restrictions to the State DES sludge management program.

Respectfully,

Michael J. Bobinsky
Director Community Services



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218 FNL
Attachment
I

NH
WATER
POLLUTION
CONTROL
ASSOCIATION

April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, NH 03301

**RE: SB 218 - Inexpedient to legislate**

Dear Chairman Russman:

The New Hampshire Water Pollution Control Association (NHWPCA) is strongly opposed to SB 218 regulating the land application of sewage sludge. As written, this bill will in effect be a ban on the beneficial use programs that have been underway for the past twenty-five years in New Hampshire. ***We urge the committee to vote inexpedient to legislate on this bill.***

There are several reasons SB 218 should be dismissed as inexpedient to legislate.

1) The bill attempts to address issues such as notification, metal limits, site suitability, and management practices that are already addressed through the NH Department of Environmental Services (NH-DES) Env-Ws 800 Sludge Management Rules. These issues belong in regulation, not statute.

2) The language in the bill is ambiguous and provides no discernable scientific basis for added restrictions that the NH-DES already regulates in the existing technical sludge management program.

3) Requiring landowners to record the use of "non-low metals sludge" in the registry of deeds is unreasonable and serves no purpose, especially when other materials such as commercial fertilizers, manures, herbicides and pesticides are not also required to be registered. Furthermore, the "high metals sludge" in New Hampshire are already "low-metals sludge" when compared to the federal and other state metals standards.

4) Highly technical and complex issues such as dioxin levels and use restrictions is a regulatory issue and should be handled by the NH-DES staff who have the expertise and resources to properly regulate. Debate and promulgation of standards by a legislative body with no scientific basis is not a sound approach to this issue.

5) Wastewater treatment facilities in New Hampshire enjoy a high rate of recycling and beneficial use of the biosolids generated annually throughout the State. However, requiring these facilities to accept septage from other towns that may have a ban on recycling biosolids is a policy inconsistent with existing statute (RSA 486:13 Disposal of Septage) requiring all towns to provide an outlet for their own septage. In addition, the cost for recycling biosolids increases due to local bans. It would be

P.O. Box 95
Concord, NH
03301

inconsistent for a host WWTF to accept septage from a ban-town thereby increasing its own costs for handling and recycling of the final biosolids produced.

6) If SB 218 is enacted to law, the subsequent increased costs will be in violation of the NH Constitution Part 1, Article 28-a that protects municipalities from unfunded state mandates.

There are several other specific details of SB 218 that are of concern to the NHWPCA. However, rather than analyze each component of the bill, ***the NHWPCA respectfully requests that the committee vote "inexpedient to legislate" and let the newly revised Env-Ws 800 Sludge Management Rules, the existing random testing program, and the competent technical staff of the NH-DES regulate the beneficial use of biosolids***.

Respectfully submitted,

Douglas W. Steele, II
President
New Hampshire Water Pollution Control Association

cc: Harry Stewart, P.E., NH-DES
Chairman Musler, Environment & Agriculture Committee
Judy Silva, Esq. - NH Municipal Association
Susan Arnold, Governor's Office

218-FN-L
Attachment J

**New England Biosolids and Residuals Association**

P.O. Box 422
Tamworth, NH 03886
603-323-SOLIDS (7654)
Fax: 603-323-7666

**Board of Directors**

Amy Barad
Boston, MA

Richard Bentzel
Waterville, ME

Ann Boslak
Gilmanton, NH

Chip Chesley
Merrimack, NH

George Dow
Brattleboro, VT

Alwynne Hellfach
Strafford, NH

Mac Richardson
Lewiston-Auburn, ME

Erick Sawtelle
Lee, NH

Mark Young
Lowell, MA

**Coordinator**
Ned Beecher

Senate Environment Committee
New Hampshire Legislature
State House
Concord, New Hampshire

April 1, 1999

**Re: SB 218**

Dear Honorable Members of the Committee:

Thank you for the opportunity to comment on the proposed legislation before you today--SB 218. The comments below are provided on behalf of the New England Biosolids and Residuals Association (NEBRA), a non-profit organization formed in December, 1997 by individuals and organizations from Maine, Massachusetts, New Hampshire, and Vermont--including wastewater treatment facility staff, farmers, environmentalists, composters, and others involved with biosolids and other residuals.

As an organization whose mission is to provide technical resources to members and the public and support on-going research, I will not provide specific comments on today's bill. However, NEBRA offers each member of the Committee, and others interested, a resource for current, research-based information on the recycling of biosolids and other residuals. For instance, if any of you do not have the explanatory EPA documents concerning the federal regulations, 40 CFR Part 503, then I would like to offer you a copy today. The federal regulations are the result of decades of concentrated research in the field of biosolids recycling and you should be familiar with them and associated federal laws and programs that ensure the quality of residuals recycling programs.

NEBRA's interest is that biosolids regulations and laws should allow for and encourage well-managed recycling programs that take advantage of the many beneficial properties in biosolids while ensuring the protection of public health and the environment. Our policy is to support regulatory and legal structures that are based on the best available, peer-reviewed science. Although it has been the target of occasional criticism, the federal 503 regulations were developed with such science and have withstood legal and scientific challenges. In addition, the 503 regulations were the subject of a peer-review analysis by the National Research Council (NRC) of the National Academy of Sciences involving experts in many different fields of specialization. I offer you a summary of the NRC findings today. NEBRA also has copies of numerous scientific reports that address all aspects of biosolids/residuals recycling--if you have a specific information need, I hope you will feel free to contact our office (and, clearly, the state Departments of Environmental Protection and Agriculture, the University, and Cooperative Extension have considerable information available to you as well).

Some critics of modern biosolids recycling would suggest that the federal efforts regarding biosolids recycling have been inadequate. The Cornell Waste Management Institute's *Case for Caution*, a working paper, is the best summary of such concerns. Its findings and recommendations have received responses from EPA, New York State, USDA and others. If you are interested in an in-depth analysis, I recommend studying these documents. (Let me know today or contact NEBRA if you need copies.) You will find that the concerns and questions you hear raised in the debate over the current legislation, while reasonable and legitimate, are not new. It is just such questions regarding the potential impacts of trace metals, pathogens, and chemical contaminants in biosolids that have been the focus of more than three decades of biosolids research. These same questions have been addressed by the 503 regulations and the National Research Council review.

As you may know, biosolids recycling is the option of choice for almost all states in this country. It is the preferred management option identified by the U.S. Environmental Protection Agency (US EPA). US EPA, USDA, FDA, and other policy-makers consider biosolids management to have been addressed adequately, through the Part 503 rule, to ensure protection of public health and the environment (as EPA was mandated by Congress to do). There has been no documented case of harm to humans or the environment through the proper use of biosolids--although you may hear claims to the contrary. NEBRA has researched three such claims in New England--including the reports from Canaan and Greenland, New Hampshire, and has found no evidence to suggest the involvement of biosolids in the unfortunate occurrences reported--NEBRA can provide you with reports upon request. Part 503 is solid; it is a fine standard on which New Hampshire can have confidence in basing its state regulations and laws. New Hampshire's residuals recycling laws are even more protective than the 503 regulations.

NEBRA encourages you to note carefully today the comments you receive from those who manage biosolids on a day-to-day basis, many of whom are NEBRA members. These people do the state and its citizens a great service in their efforts managing a waste stream to which we all contribute. They are responsible experts who do today, and have done in the past, as much to clean up and protect New Hampshire's environment and public health as anyone. NEBRA hopes that you will support the efforts of these dedicated and knowledgeable people and respond favorably to their expert testimony.

And please note that NEBRA is continuing to provide opportunities for the public to learn more about biosolids recycling. First, NEBRA has invited Dr. Rufus Chaney, a lead soil scientist at the USDA Agricultural Research Service, to present information and answer questions at a luncheon and work session April 7th in Augusta, Maine. And on April 20th, NEBRA is holding its annual conference at the Holiday Inn West in Portland. (Several New Hampshire legislators attended last year's conference here in Concord and found it very informative.) This regional conference will include a keynote by Dr. Robert Dowdy of USDA and the University of Minnesota. Dr. Dowdy has been involved with on-going studies of thoroughly-monitored sites that have received biosolids regularly since 1973. I include copies today of the flyer describing this conference and I encourage you to attend. Finally, in May and June, NEBRA will be producing another series of open houses and demonstration field visits at which the public can learn first-hand what biosolids recycling is. I encourage you to attend a Class B spreading event, or visit a local wastewater treatment or composting facility, and/or visit sites where biosolids have provided measurable benefits to soils and the environment.

Again, thank you for this opportunity to provide comments.

Sincerely,

Ned Beecher
Coordinator

218FN-L
Attachment K

Leslie E. Roberts
87 Hackett Road
Belmont, NH 03220
(603) 267-8135

To: Senator Carl R. Johnson
Senator Edward M. Gordon
From: Leslie E. and Suzanne S. Roberts SSR
Date: March 23, 1999
Re: SB 218

We write in opposition to SB 218.

We are preserving prime farmland at our farm in Belmont, keeping the land open and productive while using applied biosolids in the process.

We consider the recycling of nutrients by land application to be beneficial
to our land,
to the farmer now using it,
to the crop it nourishes,
to the public which is served by the Winnipesaukee River Basin sewer system,
and to all who enjoy using the resulting improved ground and surface waters and aquatic environment enabled by the system.

We are retired farmers, privileged to be stewards of land which has been in cultivation of one kind or another since the late 1700's. We consider this to be a treasured resource to be preserved. We would not do anything to harm the land, our drinking water, or our neighbors.

People forget -

that benefits should be balanced off against risks. Under present State standards the benefits far outweigh any risks. Changes should be based on real, factual science and field studies, not on emotional or deliberately developed misunderstandings

that when the Winnipesaukee Basin water clean-up project was being developed in the 1970's, it was recognized that what was taken out in the purification of wastewater would have to be recycled or disposed of. It benefits everyone to recycle the product on land that benefits from its monitored use

that the replacement of naturally occurring trace elements in soils which have been depleted is also part of the equation.

In general we feel that SB 218 is unnecessary over-regulation.

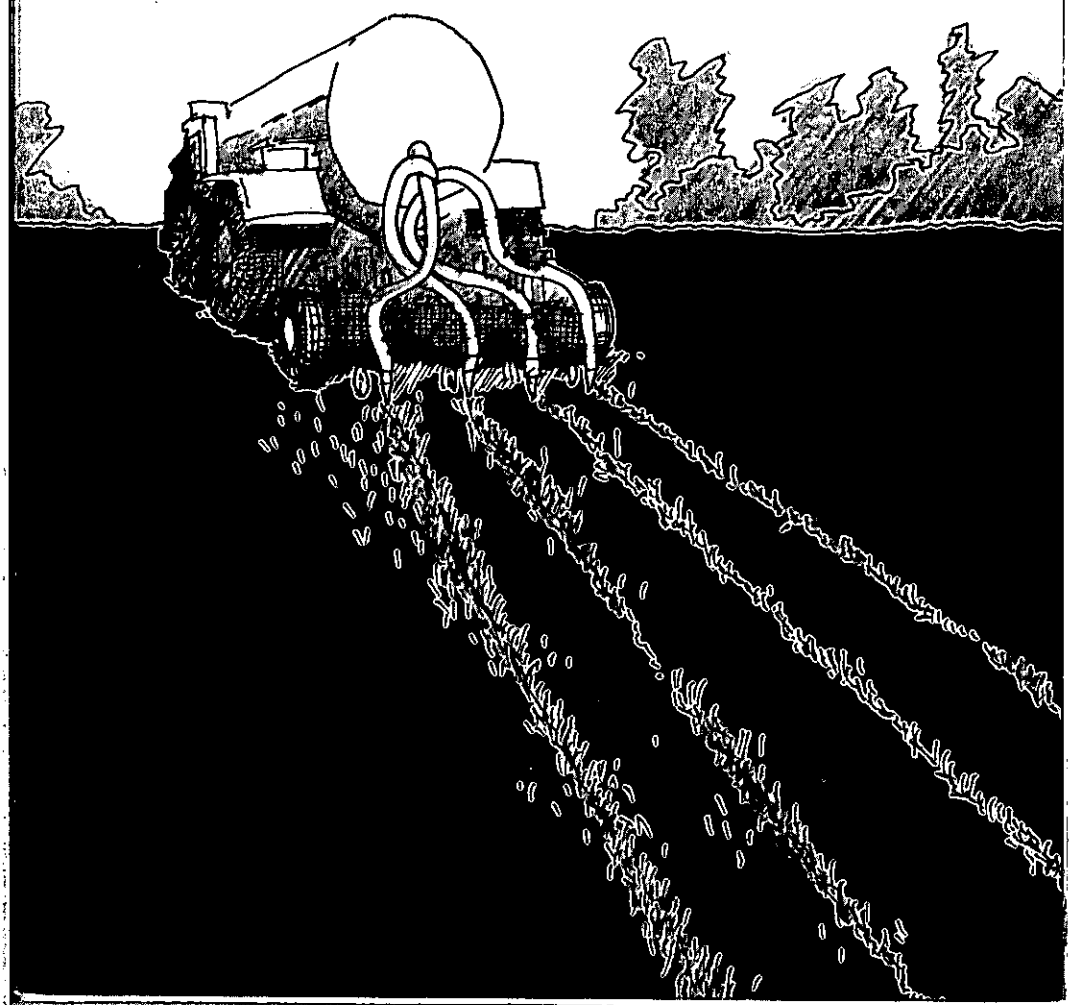
Attachment L

United States Environmental Protection Agency
EPA 832-R-94-009
June 1994

Office Of Water (4204)

EPA

# Biosolids Recycling: Beneficial Technology For A Better Environment



*Excellence in compliance through optimal technical solutions*

MUNICIPAL TECHNOLOGY BRANCH

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## OVERVIEW

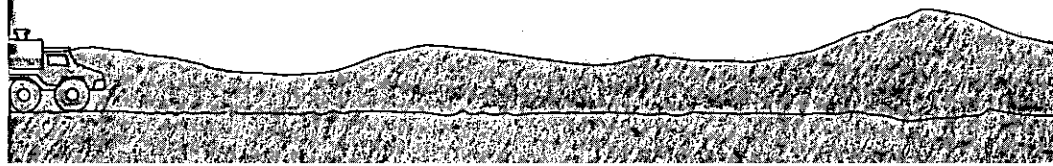
- The U.S. Environmental Protection Agency (EPA) will continue to promote practices that provide for the beneficial use of municipal sewage sludge biosolids, while maintaining or improving environmental quality and protecting human health.

- Thousands of municipalities are currently land applying or otherwise recycling their biosolids. Both agricultural and non-agricultural sites benefit from the nutrient and soil conditioning value of biosolids, which is generally worth about $100 to $140 per agricultural application of biosolids. Biosolids have been used successfully in the production of many different food, feed, and horticultural crops; in the production of sod and the maintenance of turf; for improved forest productivity; and for reclaiming and revegetating areas disturbed by mining, construction, and waste disposal activities.

- EPA continues to provide guidance and rules for the safe use of biosolids. Its current rule for the final use or disposal of biosolids (40 CFR Part 503) is the result of nearly 10 years of intensive study and development. This process involved detailed scientific risk assessment with careful evaluation of the available data, and the use of improved models and more realistic assumptions. It benefited greatly by the extensive assistance of biosolids experts.

- The biosolids now being generated are for the most part low in pollutants, rich in nutrients and organic matter, and highly suitable for recycling as a result of EPA's clean water and pretreatment efforts. The Part 503 standards provide for a wide range of different end-use possibilities for these biosolids.





## PURPOSE

This booklet is written to provide an understanding of the great value that can be derived from the beneficial use of biosolids. In addition, it discusses and reaffirms the U. S. Environmental Protection Agency's policy that encourages the beneficial use of biosolids. This booklet then briefly discusses important aspects of its new regulation (40 Code of Federal Regulations Part 503) that govern the final use or disposal of biosolids. It concludes with a discussion of the scientific basis of the rule and names of people and references to contact for additional information regarding the rule and risk assessment.

## EPA Policy on Beneficial Use of Municipal Biosolids

EPA's "Policy on Municipal Sewage Sludge (Biosolids) Management" (49 FR 24358 June 12, 1984) states that:

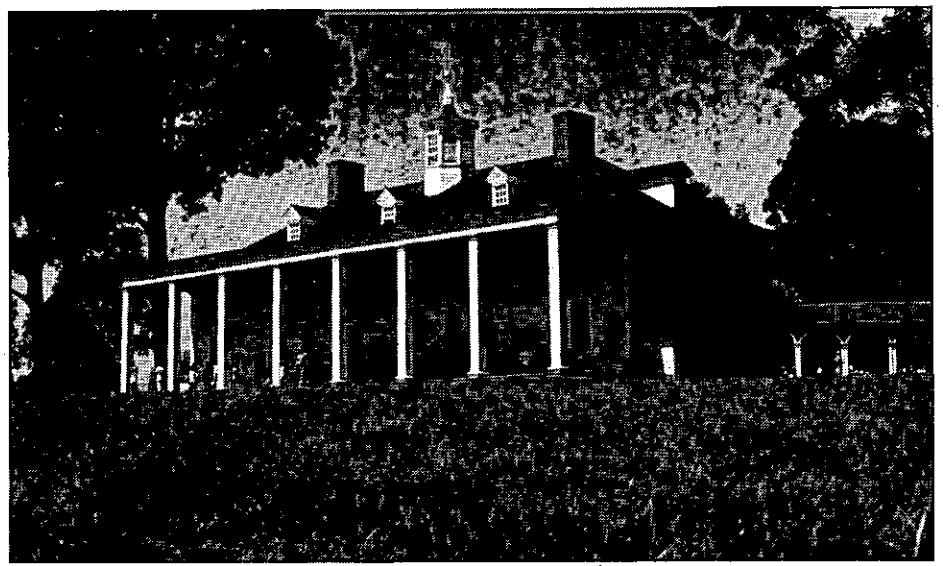
> *"The U.S. Environmental Protection Agency (EPA) will actively promote those municipal [biosolids] management practices that provide for the beneficial use of [biosolids] while maintaining or improving environmental quality and protecting public health. To implement this policy, EPA will continue to issue regulations that protect public health and other environmental values... Local communities will remain responsible for choosing among alternative programs; for planning, constructing, and operating facilities to meet their needs; and for ensuring the continuing availability of adequate and acceptable disposal or use capacity."*

As noted in the policy statement, EPA prefers well-managed practices that beneficially use municipal biosolids. Such practices include land application of biosolids as a soil amendment or fertilizer supplement and various procedures that derive energy from biosolids or convert them to useful products. These practices can help reduce the volume of biosolids requiring disposal, thus reducing the rate at which the limited capacity of disposal facilities is exhausted. Other benefits derived from recycling biosolids include improved soil fertility and tilth, reduced need for and enhanced response to inorganic fertilizers, better growth and quality of crops, and decreased consumption of energy.






**Silvigrow applications vehicle at the University of Washington Pack Forest facility.**



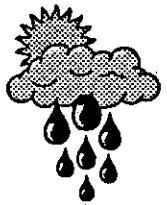
**Composted biosolids have enhanced the Mt. Vernon landscape.**

## Biosolids are a Natural Fertilizer

For many individuals sewage sludge (biosolids) induce a major emotional response. This response is understandable when you realize that ever since infancy, parents teach children that human waste is dirty and is to be avoided and flushed down the toilet. Compare this with the life-long experience of most persons familiar with animal wastes as a material to be managed and used.

Like animal waste, biosolids are a part of the natural cycle of life (Figure 1). They contain inorganic and organic compounds removed during wastewater treatment. An important perspective on biosolids -- the natural fertilizer -- can be gained from the following closer look:

*"Crops that supply our food and animal feed are grown in the soil. To grow, the crops need fertilizer and water. Essential soil fertilizer nutrients include carbon, hydrogen, oxygen, phosphorus, potassium, nitrogen, sulphur, calcium, iron, magnesium, molybdenum, boron, copper and zinc. Plants take up these essential soil-borne nutrients that are necessary for their normal growth. Using these nutrients and sunlight, plants manufacture organic carbon-rich foodstuffs such as carbohydrates, fats, and proteins.*



**Sun and rain cause crops to make carbon rich foods and provides energy for uptake of nutrients such as nitrogen, potassium, phosphorous, zinc, and molybdenum**

*The same nutrients that are essential for plant growth also are essential for the growth of humans and other animals. We gain many of these essential nutrients, along with carbohydrates, fats, and proteins, by eating plants. Wastes are excreted from humans and contain these same essential nutrient elements that are in the foods we consume. These wastes go into the municipal sewer system along with other household wastes. Municipalities also collect and treat wastewater from industrial and commercial sources. The residual solids generated during wastewater treatment were previously called sewage sludge. Sewage sludges that can be used are now being called biosolids to emphasize the beneficial nature of this valuable recyclable resource. Properly prepared biosolids provide a rich source of the essential fertilizer elements needed by plants to produce food. It seems only natural to return this rich source of nutrients and organic matter back to the soil to perpetuate the cycle of life."*

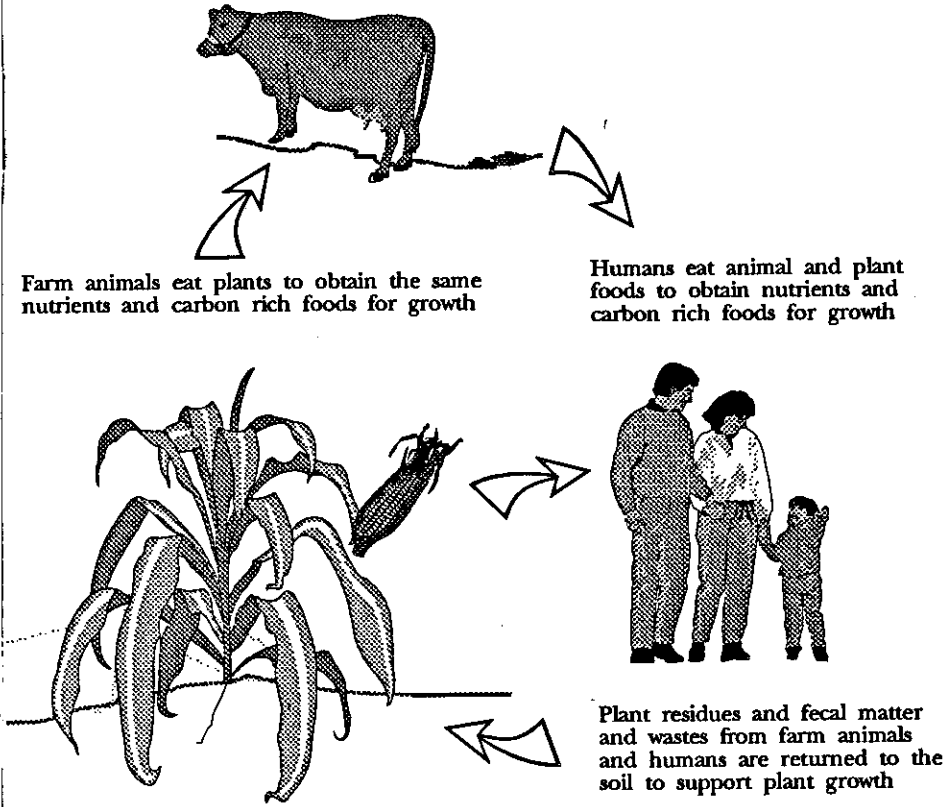



**Figure 1. Natural Cycling of Nutrients**

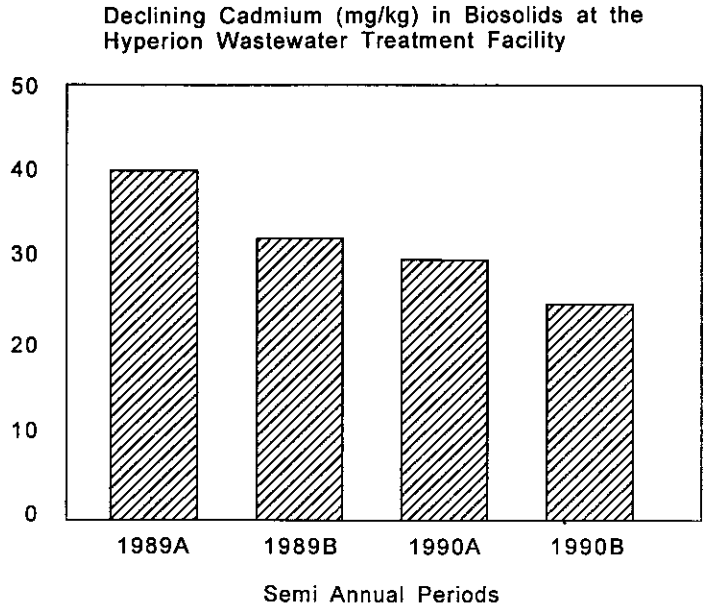



**Figure 2. Pretreatment and source control have been very successful in reducing pollutant levels in biosolids.**

Appropriate control is needed for the safe agricultural use of all fertilizers and soil conditioners -- whether in the form of biosolids, other organic amendments, or chemically-based fertilizers -- to insure that the proper amount of essential elements are provided. Controls also are needed with all fertilizers and soil conditioners to avoid contamination of groundwater with leachable excess nitrogen. Controls are needed with biosolids and animal wastes, because, depending upon the level of treatment, disease-causing organisms (pathogens) may be present and vectors such as flies and rodents can be attracted that may transmit disease. These controls come from many sources. Some control comes from following State fertilizer recommendations and sound agricultural practices. Additional control is obtained by required wastewater treatment to reduce pathogens to levels that are not harmful. Pretreatment by industry, mandated by law, is another primary control that prevents excessive levels of unwanted pollutants in wastewater and the resultant biosolids. Figure 2 shows that pretreatment and source control have been very successful in reducing the levels of pollutants in biosolids. And finally, compliance with the new Federal as well as existing State regulations requires the careful implementation of management practices and the use of biosolids application rates based on crop needs.



## Agricultural Use of Biosolids

EPA's policy that promotes the beneficial use of municipal biosolids is based on years of extensive study and experience. Hundreds of studies have been conducted as a basis for the safe use of biosolids. Moreover, thousands of publicly owned treatment works (POTWs) are currently using their biosolids as an organic fertilizer and soil conditioner on land throughout the United States. For example, over 55% and 90%, respectively, of all biosolids produced in Ohio and Maryland are used on land.

Examples of communities recycling their biosolids include Hannibal, MO (19,000 population), Madison, WI (250,000 population), and Seattle, WA (1.1 million population). Each of these municipal authorities have been winners in EPA's National Beneficial Use of Biosolids Awards Program. Hannibal, MO and Madison, WI charge farmers for using their biosolids. Hannibal recovers 100% of the costs of hauling and spreading biosolids from its sales to farmers,



**This corn crop benefitted from the use of biosolids as a fertilizer.**

**Table 1. Value of 5 to 10 Dry Tons per Acre of a Typical Anaerobically Digested Dewatered Biosolids Applied to Farmland**

| Nutrient | lbs/Acre Applied | Value/Acre |
|---|---|---|
| Nitrogen | 150 | $ 30.00 |
| Phosphorus ($P_2O_5$) | 150 | $ 30.00 |
| Potassium ($K_2O$) | 10 | $ 1.00 |
| Copper (Cu) | 7 | $ 14.00 |
| Zinc (Zn) | 10 | $ 12.50 |
| Sulfur | 20 | $ 10.00 |
| Lime | 1 ton | $ 28.00 |
| Spreading | | $ 15.00 |
| **Total Value*** | | **$140.00** |

* Value of organic matter is in addition to this total

Madison receives $12 per acre for applying their biosolids. Madison fertilizes 3,000 to 4,000 acres of farmland with biosolids each year and has farmers waiting with a total of 22,000 acres of farmland available for application. Seattle applies biosolids to forest as well as agricultural land.

Since 1974, all the biosolids from metropolitan Washington, DC (3 million population) have been used on land. In 1993 about 75% (87,000 dry tons) of the dewatered biosolids produced was used on agricultural land in Maryland (4,000 acres) and Virginia (4,000 acres). The remaining 25% was composted for use by landscapers, horticulturalists, and the general public. The dewatered biosolids were applied to private farmland by private contractors at no charge to the farmers. The farmers received $100 to $140 worth of needed nitrogen, phosphorus, trace nutrients, lime, and organic matter per acre from each 5 to 10 dry ton per acre application of biosolids (Table 1).

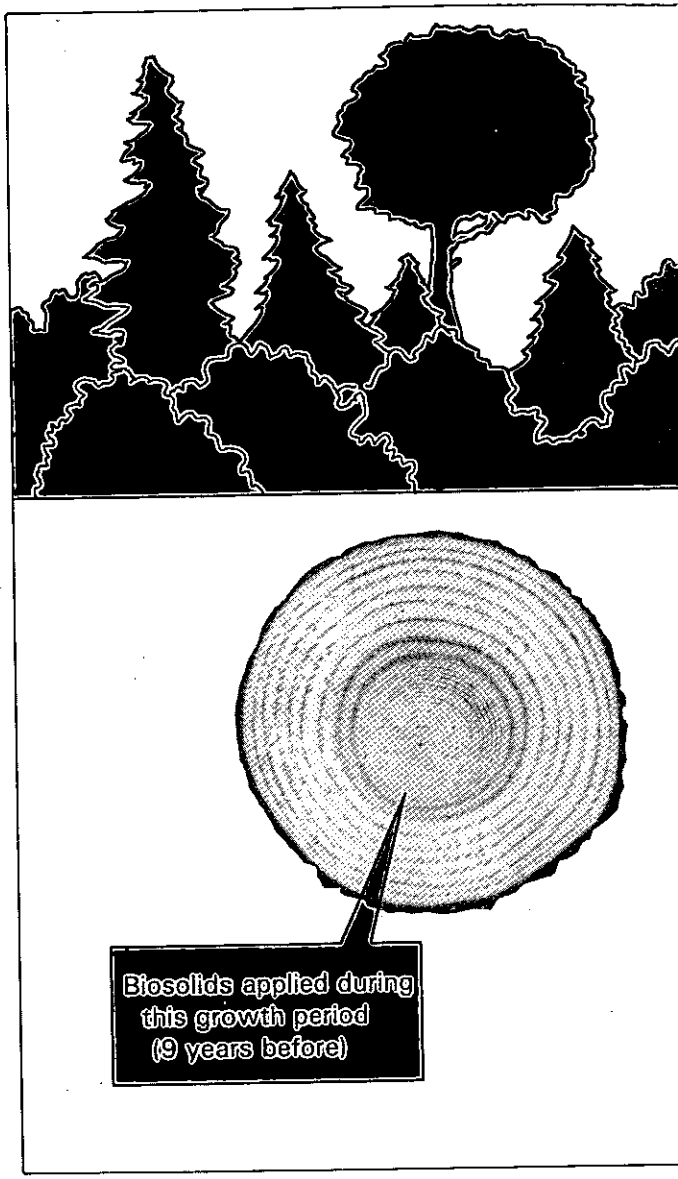
An additional benefit of biosolids is its suppression of pathogenic soil organisms such as nematodes that damage plant roots as well as specific plant root diseases that otherwise cause damage to commercially grown potted plants.



## Non-Agricultural Use of Biosolids

The beneficial uses of biosolids are not limited to farmland application. Biosolids are used in silviculture to increase forest productivity and to revegetate and stabilize lands that have been harvested or disturbed by mining, construction, fires, land slides, or other natural disasters.

The application of biosolids to forest land can shorten pulp wood and lumber production cycles by accelerating tree growth, especially on marginally productive soils. Studies by the University of Washington in the Northwest, and the U. S. Forest Service in the Southeast, on the use of biosolids as a fertilizer in silviculture have shown as much as a three-fold increase in tree growth compared to controls for certain tree species.



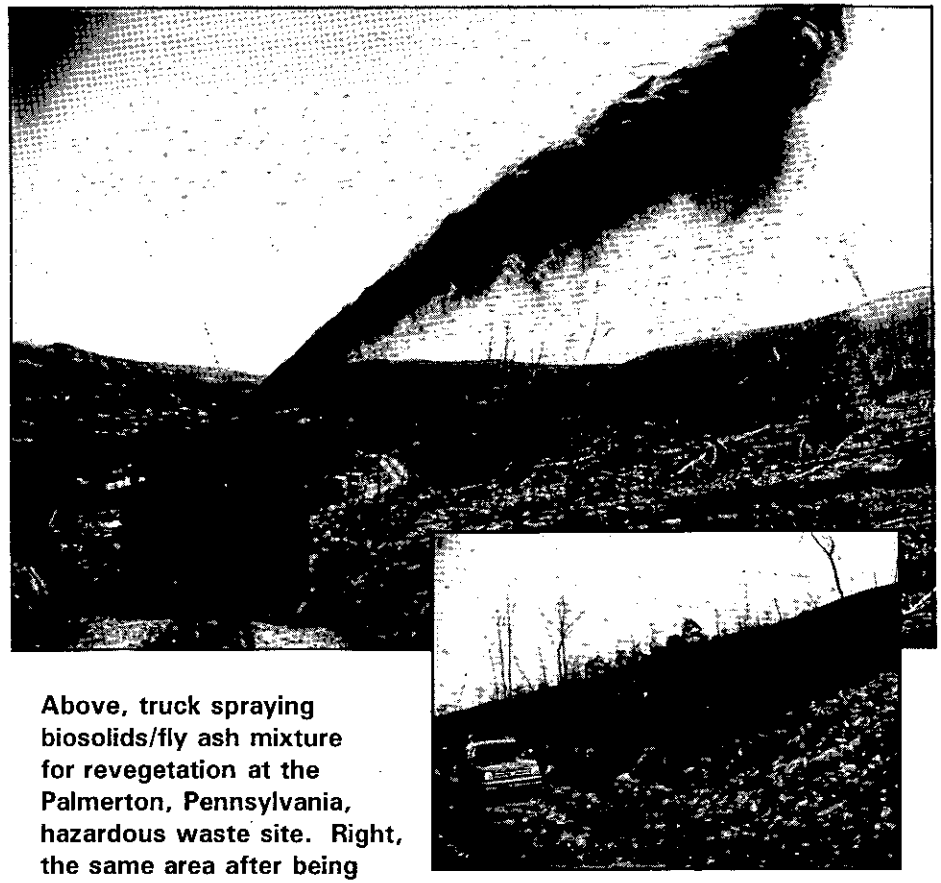

**A cross-section of a Douglas fir tree demonstrates how biosolids increase tree growth.**

Biosolids are used productively to stabilize and revegetate areas destroyed by mining, dredging, and construction activities. Alkaline-stabilized, digested, air-dried, and composted biosolids are frequently used to help revegetate mine spoil, highway embankments and median strips, and other construction sites.

Alkaline-stabilized biosolids are also used as a soil substitute for intermediate and final landfill cover. The use of biosolids in land reclamation efforts has proved very successful and comparable in cost to other commercial methods in both large- and small-scale projects. For example, in a strip-mined area in Fulton County, IL, reclamation using municipal biosolids costs about $3,700 per acre, as compared with a range of $3,400 to $6,300 per acre using commercial methods.

Studies in New Mexico have shown sustained improved growth and nutritional quality of desirable native vegetation on rangeland and reduced run-off of rain water from a one-time, 10 to 20 dry tons per acre surface application of biosolids. Studies in Colorado, with 1 to 15 dry tons per acre of biosolids applied, are being conducted to determine optimum rates to improve range quality and minimize public health and environmental risks. Early results from these studies show similar improvements in range quality and reduced water runoff proportional to the rate of biosolids application.

Biosolids have been used to reclaim over 3,000 acres of lands devastated by mining and smelting activities in Pennsylvania. Biosolids are being used in combination with fly ash to revegetate soils at that Palmerton, PA, site which has been included on EPA's list of Superfund Sites. The Palmerton site was so highly contaminated from 90 years of smelting zinc that all vegetation in the surrounding area was destroyed. The research team members from Allentown, PA, and the Pennsylvania State University, who were responsible for demonstrating the viability of the reclamation procedures, were recognized as winners in EPA's first National Beneficial Use of Biosolids Awards Program (1988).



**Above, truck spraying biosolids/fly ash mixture for revegetation at the Palmerton, Pennsylvania, hazardous waste site. Right, the same area after being reclaimed.**

## Biosolids Recycling: Practices and Benefits

Biosolids may be used separately or in conjunction with chemical fertilizers. Figure 3A shows the comparative use of chemical fertilizers with and without 8 dry tons per acre of biosolids applied to sandy irrigated soils near Yuma, AZ. Figure 3A shows the comparative usage during the first year after biosolids application where only about one-fourth as much chemical fertilizer was needed. By the third year of biosolids application, no supplemental chemical fertilizer was required.

Fewer Pounds per Acre of Chemical Fertilizer Nutrients Were Needed When Biosolids Were Used

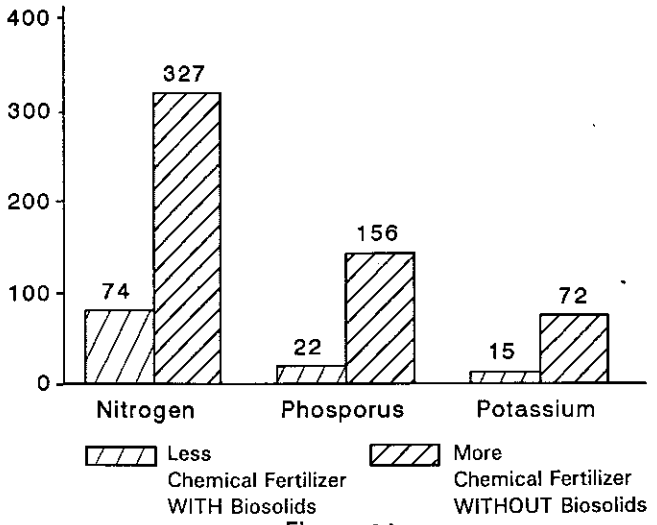



Figure 3A

Figure 3B shows that the yield of three crops was greatly enhanced compared with their yields on both chemically fertilized and unfertilized controls.

Comparative Yield of Crops Due to Chemical Fertilizers vs. Biosolids

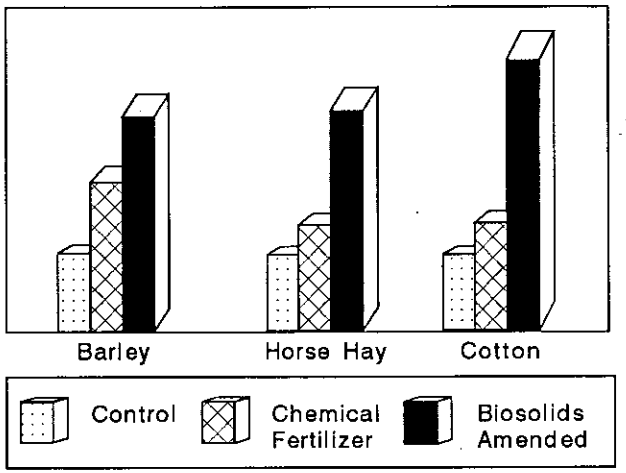
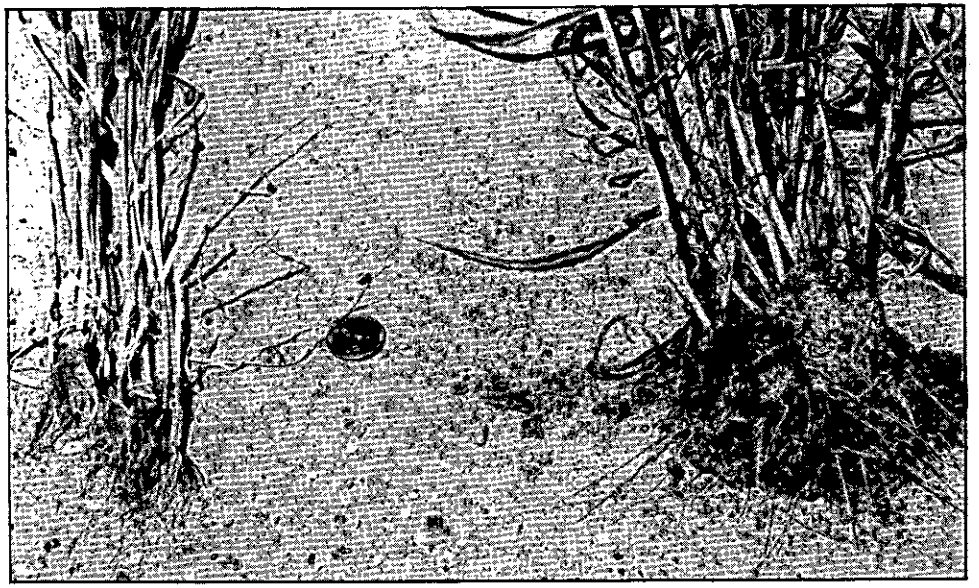



Figure 3B

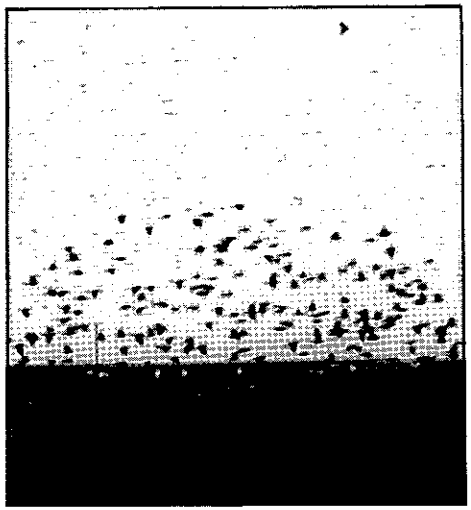
Particularly in soils that are low in organic matter, biosolids provide benefits that are not available from chemical fertilization. The biosolids' organic matter content enhances the soil rooting media thus providing for better water retention, improved air exchange around plant roots, and increased ability of the soil to hold nutrients in a plant-available state (increased cation exchange capacity). In sandy, highly leachable soils, the tendency for biosolids' organic nitrogen to be released at a rate that is consistent with plant uptake, mitigates the loss of excess nitrogen into groundwater.

The biosolids' organic matter had other impacts on the same Yuma, AZ farm that initially might have seemed undesirable. Herbicides became less effective because of their interaction with the changing sandy soil and organic biosolids matrix. Those fields, previously weed-free, now contained more weeds. On the other hand, the plants became more vigorous and better able to compete with weeds and withstand damage from insect pests. The changes that occurred because of biosolids usage allowed the farmer to decrease his costs for fertilizer, herbicides, and pesticides by approximately $170 on each acre of his 12,000 acre farm.



**Comparative plant vigor on sandy Yuma, AZ, soil without (left) and with (right) biosolids amendments.**

In some instances the total yield decreased compared to weed-free fields. However, the farmer's net return per acre increased (more dollars per acre profit). The same Yuma, AZ farmer, because of his enhanced yield and lowered costs from use of biosolids, decided to dedicate 10% of his land each year to producing grains for wildlife. Because of the farming changes that left more cover from weeds on all 12,000 acres and the 1,200 acres left each year with unharvested grain for wildlife, the dove and other wildlife population increased so substantially in 6 years that the Yuma region began to realize an unexpected $3.5 million increased annual benefit from hunting-related activities.



**Increased populations of birds over biosolids-amended farm fields in Yuma.**

## Other Uses for Biosolids

The sale of biosolids products to the public for many kinds of garden, nursery, household, and lawn uses continues to increase. Treatment such as heat-drying, composting, and treatment with alkaline materials convert biosolids into useful products that can be considered "exceptional quality" if pollutant concentrations in the biosolids do not exceed the minimum levels specified in Table 3 of the Part 503 rule. These products are safe for unrestricted use by the general public. Generators of these products are required to have an ongoing monitoring program to ensure that the biosolids continually meet the "exceptional quality" requirements.

Examples of these stabilized products include Milwaukee's heat-dried biosolids product, "MILORGANITE,"* which it has been producing and selling throughout the United States since the 1920's.

Products of this nature have sold in bulk for as for as much as $190 per ton if high in nitrogen content and aesthetically pleasing. Kellogg Supply Company (a private firm in California) has been producing and marketing composted biosolid products (e.g., NITROHUMUS, TOPPER, GRO-MULCH) mostly in California, Arizona, and Nevada for a similar period of time. Their products include composted biosolids that have come predominantly from Los Angeles County, CA, wastewater treatment facilities. Both MILORGANITE and NITROHUMUS have been used to establish and maintain grass playing fields in sports stadiums across the country -- including the Rose Bowl. A composted biosolids product from Philadelphia called EARTHGRO has been used with great success for growing container plants and chrysanthemums. Even the White House has used composted biosolids to reestablish its lawns. Several years ago, 825 tons of composted biosolids (COMPRO) were used in this highly successful project. Similarly, the lawns at Mount Vernon, the Washington Monument Grounds and the Governor's Mansion in Annapolis, MD, were renewed with COMPRO. The first use of composted biosolids on the Washington, DC Mall (nearly 6,000 tons) was in 1976 to establish the Constitution Gardens in time for the United States Bicentennial Birthday celebration. COMPRO is currently being sold for $10 to $50 per cubic yard in bulk depending on quantity



**Research projects have yielded impressive results. Corn plants on the left were grown in biosolids-amended soil.**

* Vendor and trade names are included for the benefit of the reader and do not imply endorsement by EPA.

delivery. The cost for their bagged product is $5 to $6 per cubic foot.

Current research by Heneghan, et.al. regarding the potential use of biosolids to remediate soils containing high levels of lead by reducing the soil lead bioavailability shows promise. The research is indicating that appropriately produced and applied biosolids may actually enhance child health because the biosolids matrix reacts with the lead in contaminated soils to reduce the bioavailability of the soil lead. The research involved the feeding of laboratory animals an otherwise completely balanced diet that also containing 9% of either a low or high-lead containing urban soil mixed with 1% of different biosolids products.

**Comparative Percentage Uptake of Lead from Soil With and Without Biosolids into Bones of Test Animals**

**(In the Test, Complete Diets for the Test Animals were Amended With 9% High-Lead Soil With and Without 1% of Five Different Types of Biosolids)**

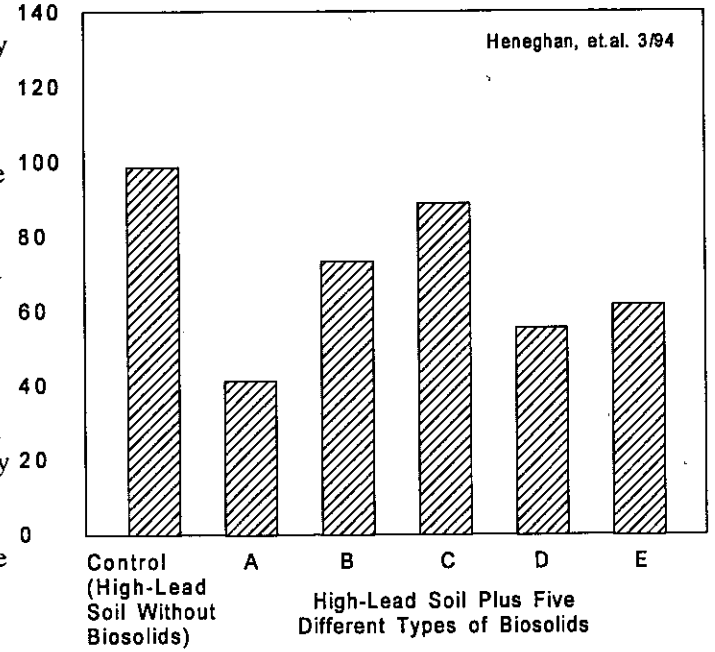
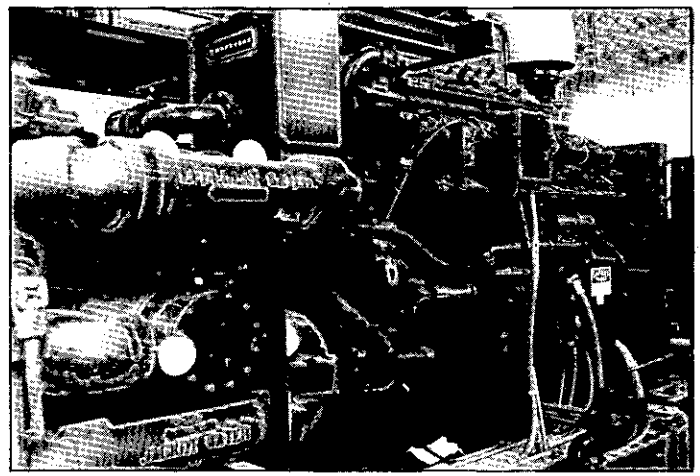



**Figure 4. Biosolids can reduce the bioavailability of soil lead**

The preliminary results from these animal feeding studies, depicted in Figure 4, show up to 50% reduced bioavailability of ingested lead, (i.e., reduced absorption of ingested soil lead into the blood and body tissues reflected by bone levels). Such data suggest that children ingesting biosolid-treated soil and dust may have a decreased absorption of lead into the blood stream, thus lessening the potential for lead-induced nerve and brain damage. Additional research is needed with laboratory animals to determine the best form of biosolids to use and the reduction of bioavailability that is possible.

Another stabilization method that is commonly used by many wastewater treatment works is anaerobic digestion. This stabilization process generally yields a Class B biosolids product as defined in EPA's Part 503 rule that has been spread for years on agricultural land in liquid form and as a dewatered product. One of the most economical and agriculturally beneficial methods for using biosolids is the land application of this type of stabilized product.

Methane gas is generated during the anaerobic digestion process and has considerable value. For example, the Tampa, FL, treatment works recovers about $700,000 worth of electricity each year from methane it produces during anaerobic digestion. This is equivalent to approximately $65 worth of net electricity being produced per dry ton of volatile biosolids removed from the digester. Tampa also uses the heat removed from the electrical generators to provide more than 95% of the warmth needed for the digesters. All but 10 to 15% of Tampa's anaerobically digested biosolids are being heat-dried and marketed for between $85 to $120 per dry ton. The balance is being land applied in dewatered form. Tampa was recognized for this highly efficient operation in EPA's 1992 Beneficial Use of Biosolids Awards Program.



**A 500-kilowatt engine and generator using biosolids digester gas to produce electricity.**

## Expert Opinions Regarding Biosolids Useability

In 1981, Del Monte Corporation, along with other food processors, announced that they would no longer accept fruit and vegetables for processing that had been grown on biosolids treated soils. Officials from the U.S. Department of Agriculture (USDA), the Food and Drug Administration (FDA), and EPA met with representatives of the National Food Processors Association to address the food processor's concerns.

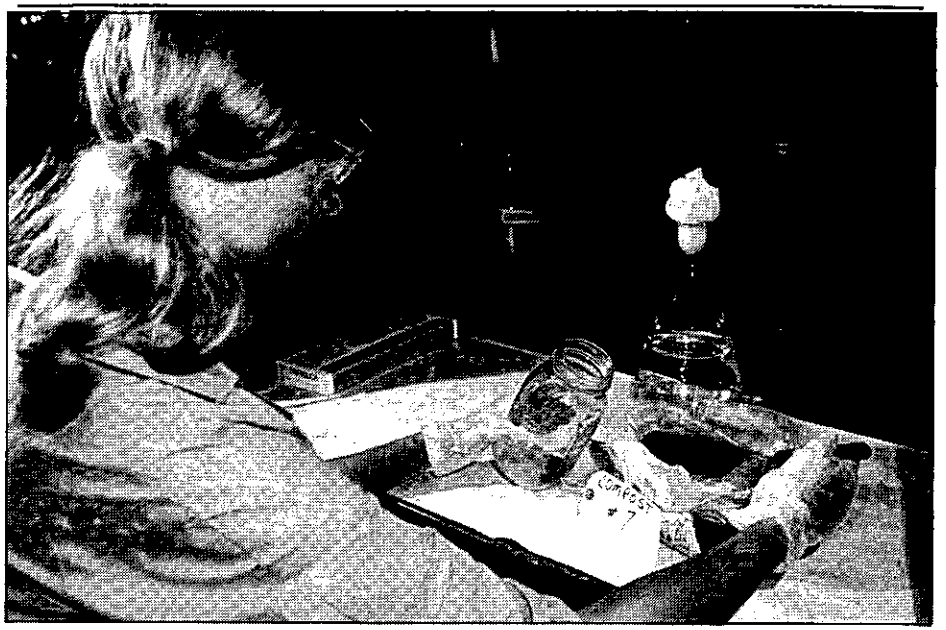
After analyzing the available health and safety information pertaining to these practices, the USDA, FDA, and EPA issued guidance and a joint policy statement in 1981 that was signed by the Administrators of each Agency. The Agencies endorsed using biosolids on land for producing fruits and vegetables, and concluded:

> *"that the use of high quality [biosolids], coupled with proper management procedures, should safeguard the consumer from contaminated crops, minimize any potential adverse effect on the environment,"* and
>
> *"that, with the adherence to the guidance contained in this document, the safety and wholesomeness of the fruit and vegetable crops grown on [biosolids]-amended soils will be assured."*

In 1983, over 200 health and environmental experts from the United States, Canada, and Europe met in Denver, CO, to assess the state of the art for biosolids use and disposal (ten years after a similar meeting in Champaign, IL). These experts arrived at a published consensus that the existing guidance and regulations were adequately protective of public health and the environment, provided that biosolids were used in accordance with those provisions. They concluded:

> *"Guidelines have been developed to enable the environmentally safe use of [biosolids] containing median concentrations of metals and organics when the [biosolids] are applied at agronomic rates based upon nitrogen or phosphorus utilization by crops."*
>
> *"Groundwater monitoring for nitrate-nitrogen is not needed where [biosolids] nitrogen additions do not exceed fertilizer nitrogen recommendations for the crop grown."*
>
> *"Using [biosolids] for reclamation of disturbed land at rates higher than those for agricultural land, when properly implemented and managed, improve the quality of soils, groundwater or vegetation."*
>
> *"With proper management and safety allowances based on research data, land application is a safe, beneficial and acceptable alternative for treatment of municipal wastewater and [biosolids]."*





**Sampling composted biosolids for pathogen analysis. Studies show that properly composted biosolids are safe for use.**

Some concern has been expressed about the possibility that land-applied biosolids might damage crops, livestock, or the land itself resulting in possible financial loss to the farmer or his mortgage lender. Some concern has also been expressed about possible future loss that might occur if new discoveries were to show unanticipated hazards from previous biosolids use.

While there can be no guarantees, past experiences with agronomic use of biosolids have been very reassuring. Where biosolids have been applied in accordance with regulations, problems that have occurred are rare and are generally related to inadequate field management and not biosolids quality -- virtually the same type of problems which have occurred from other normal farming practices. All research to date leads to the conclusion that the agronomic use of high quality biosolids is sustainable and very safe.

## Final Part 503 Standards for the Use or Disposal of Biosolids

### *Overview of the Development of the Rule*

Each series of biosolids guidance and regulations, developed by EPA since the mid 1970's, has been based upon the most recent knowledge about the risks and benefits of disposing and using biosolids. Over time, the amount of information and understanding obtained from research and operational experience upon which these efforts were based has continued to increase. The EPA effort to determine what would be permissible increases in soil and crop pollutant contents as a result of biosolids additions to land has been scientific and conservative and has involved the expert assistance of USDA and other cooperating institutions. This EPA approach contrasts with the policy-based approach taken by some other countries to limit increases of pollutants in soils to some small fraction of "background environmental levels" without careful assessment of positive or negative impact.

As a result of the statutory directive in Section 405 of the Clean Water Act, EPA has expanded its regulatory efforts by developing a new comprehensive risk-based rule for biosolids. In this expanded effort, which began in 1984, EPA increased the number of pollutants considered to over 50. However, after careful screening and analysis, the Agency reduced this to a list of 25 crucial pollutants (Tables 2A/2B).

**Table 2A. Most Limiting Pathway for Each Biosolids Pollutant Remaining in the Final Part 503 Rule***

| Sludge Pollutant | Highly Exposed Individual | Most Limiting Pathway |
|---|---|---|
| Arsenic | Biosolids eaten by child | 3 |
| Cadmium | Biosolids eaten by child | 3 |
| Chromium | Phytotoxic plant | 8 |
| Copper | Phytotoxic plant | 8 |
| Lead | Biosolids eaten by child | 3 |
| Mercury | Biosolids eaten by child | 3 |
| Molybdenum | Animal eating feed | 6 |
| Nickel | Phytotoxic plant | 8 |
| Selenium | Biosolids eaten by child | 3 |
| Zinc | Phytotoxic plant | 8 |

* The regulatory limit for each pollutant was based on the exposure pathway found to be the most limiting for that pollutant.

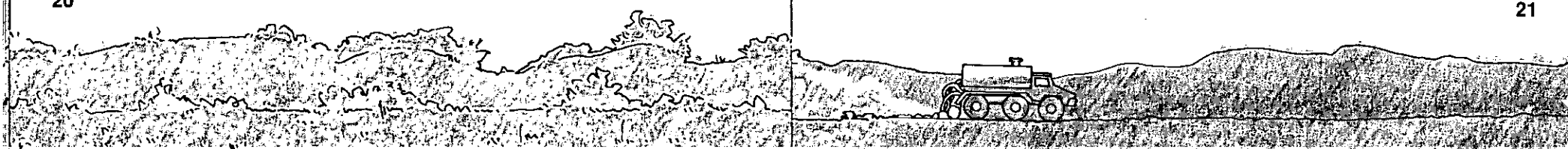
**Table 2B. Most Limiting Pathway for Each Biosolids Pollutant Deleted from the Final Part 503 Rule****

| Biosolids Pollutant | Highly Exposed Individual | Most Limiting Pathway |
|---|---|---|
| Aldrin | Eating animal fat/milk | 5 |
| Dieldrin | Eating animal fat/milk | 5 |
| Benzo(A)Pyrene | Biosolids eaten by child | 3 |
| Chlordane | Biosolids eaten by child | 3 |
| DDT/DDD/DDE | Eating fish | 12 |
| DimethylNitrosamine | Biosolids eaten by child | 3 |
| Heptachlor | Eating animal fat/milk | 5 |
| Hexachlorobenzene | Eating animal fat/milk | 5 |
| Hexachlorobutadiene | Eating animal fat/milk | 5 |
| Lindane | Biosolids eaten by child | 3 |
| PCB's | Eating animal fat/milk | 5 |
| Toxaphene | Eating animal fat/milk | 5 |
| Trichloroethylene | Biosolids eaten by child | 3 |

** Pollutant deleted because (1) it was not present in NSSS studied biosolids, (2) it was only present in biosolids at levels about 10 to 100 times below the pollutant limits calculated by risk assessment for biosolids to be protective of human health and the environment, or (3) the pollutant has been banned by EPA and is no longer being manufactured or used in the United States.







Risk from exposure to these 25 pollutants was evaluated via 14 different public health and environmental pathways (Table 3). The new method, which was established for conducting this multimedia risk assessment, was reviewed and approved by EPA's Science Advisory Board.

Many careful decisions were made during this intensive effort to select data that was more representative, assumptions that were more realistic, and models that were more appropriate. This effort has resulted in a final rule with many of the proposed standards becoming less restrictive and complex than previously believed necessary because of the more comprehensive and appropriate research data base, assumptions, and modeling.

Rule development will continue. Additional pollutants may be added to or deleted from the Part 503 rule, and restrictiveness may change. One example of change in the Part 503 rule was the elimination from the regulation, after initial proposal and subsequent evaluation, of 14 toxic organic pollutants. The basis for elimination is discussed in a later section of this document entitled "Features of the Risk Assessment Process" and are also listed in a footnote to Table 2.

Table 3. Pathways of Exposure from Land Application of Biosolids

| | PATHWAY | DESCRIPTION |
|---|---|---|
| 1 | Biosolids-Soil-Plant-Human | Consumers in regions heavily affected by landspreading of biosolids |
| 2 | Biosolids-Soil-Plant-Human | Farmland converted to residential home garden five years after reaching maximum biosolids application |
| 3 | Biosolids-Soil-Human | Farmland converted to residential use five years after reaching maximum biosolids application with children ingesting biosolids-amended soil |
| 4 | Biosolids-Soil-Plant-Animal-Human | Households producing a major portion of their dietary consumption of animal products on biosolids-amended soil |
| 5 | Biosolids-Soil-Plant-Human | Households consuming livestock that ingest biosolids-amended soil while grazing |
| 6 | Biosolids-Soil-Plant-Animal | Livestock ingesting food or feed crop grown in biosolids-amended soil |
| 7 | Biosolids-Soil-Animal | Grazing livestock ingesting biosolids/soil |
| 8 | Biosolids-Soil-Plant | Crops grown on biosolids-amended soil |
| 9 | Biosolids-Soil-Soil Biota | Soil biota living in biosolids-amended soil |
| 10 | Biosolids-Soil-Soil Biota-Biota Predator | Animals eating soil biota living in biosolids-amended soil |
| 11 | Biosolids-Soil-Airborne Dust-Humans | Tractor operator exposed to dust from biosolids-amended soil |
| 12 | Biosolids-Soil-Surface Water/Fish-Humans | Humans eating fish and drinking water from watersheds draining biosolids-amended soils |
| 13 | Biosolids-Soil-Air-Human | Humans breathing fumes from any volatile pollutants in biosolids |
| 14 | Biosolids-Soil-Groundwater-Human | Humans drinking water from wells surrounded by biosolids-amended soils |







## *Expert Assistance with the Rule and Risk Assessment*

The best scientific talent and data were assembled and used to structure the final Part 503 rule. Twelve experts (Table 4) with extensive experience in the field of evaluating the benefits and risks of using biosolids assisted in its formulation. These experts, who collectively had over 300 years of training and research experience, were from Universities, EPA, and other Federal Agencies. The carefully reasoned science and policy decisions which occurred have provided the best rule ever developed for governing the use or disposal of biosolids. EPA believes that this Part 503 rule fully meets the Congressional mandate to be protective of public health and the environment and allows for the safe and effective recycling of biosolids -- indeed providing beneficial technology for a better environment.

**Table 4. Expert Cooperators in the Part 503 Risk Assessment**

| | |
|---|---|
| Dr. Rufus Chaney<br>USDA-ARS<br>Beltsville, MD | Dr. Andrew Chang<br>Dept. of Soil & Environmental Science<br>University of California<br>Riverside |
| Dr. Willard Chappell<br>Center for Environmental Science<br>University of Colorado<br>Denver | Dr. Lawrence Gratt<br>IWG Corporation<br>San Diego, CA |
| Dr. Robert Griffin<br>Dept. of Chemical Engineering<br>University of Alabama<br>Birmingham | Charles Henry<br>College of Forestry Resources<br>University of Washington<br>Seattle |
| Dr. Terry Logan<br>Dept. of Agronomy<br>Ohio State University<br>Columbus | Dr. George O'Connor<br>Dept. of Soil Science<br>University of Florida<br>Gainesville |
| Dr. Al Page<br>Dept. of Soil & Environmental Science<br>University of California<br>Riverside | Dr. Jim Ryan<br>Risk Reduction Engineering Lab<br>US EPA<br>Cincinnati |
| Dr. Robert Wagenett<br>College of Agriculture & Life Science<br>Cornell University<br>Ithaca | Dr. John Walker<br>OWEC<br>US EPA<br>Washington, DC |



### *Features of the Risk Assessment Process*

The following brief examples describe some of the valuable information that has come from extensive research by EPA and others on the safe and continuing use of biosolids. The examples show how this information was used in the scientific risk assessment that resulted in a comprehensive, sometimes less restrictive, and simplified final Part 503 rule.

Research has shown that the biosolids-organic-chemical matrix greatly impacts the plant uptake/bioavailability of pollutants, even after the biosolids have been mixed with soil. This means that certain pollutants cannot be drawn into the plant because they are bound in a form that is unavailable to the plant. Data from sites that are nearly 100 years old show that this binding effect does not change over time. Hence, only data from field experiments where biosolids had been applied were used, not data from chemical salts applied to soils.

Another area of intensive study and data review centered on the issue of potential cadmium toxicity. It was found that most crops grown in biosolids-amended soils do not take up high levels of cadmium. Those sensitive crops that do accumulate cadmium (generally vegetables) also accumulate calcium, iron and zinc, other elements that are contained in biosolids. Hence, persons eating "sensitive" accumulator crops will simultaneously ingest all those elements. Studies have shown that calcium, iron and zinc inhibit cadmium absorption in the intestine of individuals -- thus preventing levels of this metal from accumulating. Hence, the use of this information in the risk assessment process led to a Part 503 cadmium limit being less restrictive than when the rule was proposed.

Another example of how information was developed to formulate the final rule came from the National Sewage Sludge Survey (NSSS) conducted in 1988. In this survey, biosolids analytical data from about 200 statistically representative treatment plants across the United States were reviewed for the prevalence of more than 400 toxic organic pollutants. The scientific review of this data revealed that a

majority of the toxic organic pollutants were not present in biosolids at detectable levels and that risk assessment for the various toxic organic pollutants under consideration showed no anticipated adverse effects at the levels that were detected. This information, coupled with the fact that many of these toxic organic pollutants were no longer manufactured or in use, led to the decision not to include these pollutants in the final rule.

### *Part 503 Rule Has Conservative Elements*

Even though research has shown that pollutant uptake by crops grown in biosolids-amended soils is less than linear (i.e., less than directly proportional to the amount of biosolids-contained pollutant that was added to the soil), the assumption used for the Part 503 risk assessment was that pollutant uptake by crops is linear (Figure 5). This means that the risk assessment assumes greater uptake of pollutants into plants and hence exposure to the humans and the environment than actually occurs.

EPA has also continued to use the conservatively established risk-reference-doses in the risk assessment for the final rule to estimate the lowest amount of pollutant that the highly exposed individual in each pathway can safely tolerate. The toxicological studies that were used to establish many of the risk-reference-doses often

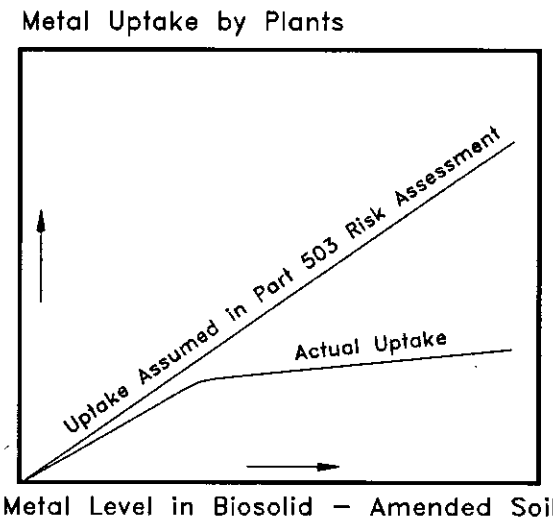



**Figure 5. Conservative Assumption of Metal Bioavailability to Plants**



were based on studies in which pure chemical doses of the pollutants were fed directly to the test animal without food or injected directly into the animal. These procedures overestimate risks because the actual bioavailability and toxicity of pollutants are much less when the pollutants are in a biosolids- or food-borne matrix than when the pure chemical form is placed directly in the stomach or injected directly into blood stream of the test animal.

### *High Quality Biosolids as a Product*

A major simplification of the rule resulted because additional research and risk analyses showed that an exceptional quality (EQ) biosolids product with low levels of pollutants and highly reduced pathogen and vector attractiveness can be safely used by the general public in a manner similar to any other commercial fertilizer/soil conditioner product. Once the Part 503 requirements for EQ biosolids are met (this includes continued demonstration of EQ quality by periodic monitoring, record keeping, and reporting), there is no further regulation by the Part 503 rule. EQ biosolids are generally produced by composting, heat-drying, or stabilization with alkaline materials.

### *Equally Protective Regulatory Options*

The Part 503 rule includes several options for regulating the uses of biosolids -- each with different levels of control. Each of the options is equally safe and protective of public health and the environment. The safety is ensured by the combination of pollutant limits and management practices imposed by each option.

The most simple option from a regulatory perspective is the EQ biosolids option just described. Here, safety is assured by imposition of stringent pollutant, pathogen and vector attraction reduction limits. Such EQ biosolids materials are marketed to, and used by, the general public without tracking. A more detailed, equally protective option is the one in which less stringent pollutant, pathogen and vector attraction reduction alternatives are coupled with site and crop controls and operational standards to ensure safe large-scale agricultural use.

## Conclusion

We hope that this discussion of the rule and risk assessment process helps you to understand and be more comfortable with EPA's new standard for beneficial use of biosolids. More detailed discussions of the data, assumptions, and models used in the risk assessment process can be found by reading the Technical Support Documents that were issued along with the final rule and EPA's "Guide to the Biosolids Risk Assessment Methodology for the EPA 503 Rule," EPA/832-B-93-005, which should be completed by the end of 1994.

Additional understanding can be gained from the preamble to the rule and the papers written by the experts who have assisted EPA in selecting appropriate data, assumptions, and models. The rule itself is described in greater detail in EPA's "Plain English Guide to the EPA 503 Biosolids Rule," EPA/832-R-93-003. To help address remaining concerns, EPA has sponsored and will continue to sponsor and foster research and information sharing events, as well as provide technical assistance and written publications.



**Strip-mined land in Pennsylvania reclaimed with the use of biosolids.**



## Sources of Information

EPA Materials Available From:

Office of Water Resource Center (OWRC)
202-260-7786 (phone)
US EPA
401 M Street SW (RC-4100)
Washington, DC 20460

Center for Environmental Research Information (CERI)
513-569-7562 (phone)
513-569-7585 (fax)
26 West Martin Luther King
Cincinnati, OH 45268

National Technical Information Service (NTIS)
800-553-6847 (phone)
703-487-4650 (phone)
703-321-8547 (fax)
US Dept. of Commerce
5285 Port Royal Road
Springfield, VA 22161

Education Resource Information Center (ERIC)
614-292-6717 (phone)
614-292-0263 (fax)
C/O West Virginia University
P.O. Box 6064
Morgantown, WV 26506

## EPA Materials

*A Plain English Guide to the EPA 503 Biosolids Rule.* USEPA Office of Wastewater Enforcement and Compliance. EPA/832-R-93-003. June 1994. To be available in 1994 from OWRC.

*POTW Sludge Sampling and Analysis Guidance Document.* USEPA Office of Wastewater Enforcement and Compliance (1st Edition, August 1989. Available from NTIS [PB93-227957] and ERIC [W134]. Revised 2nd Edition Expected in 1994.

*Environmental Regulations and Technology: Control of Pathogens and Vector Attraction in Sewage Sludge.* USEPA Office of Research and Development. EPA/625/R-92/013. December 1992. Available from CERI.

*Domestic Septage Regulatory Guidance: A Guide to the EPA 503 Rule.* USEPA Office of Wastewater Enforcement and Compliance. EPA/832-B-92-005. July 1993. Available from OWRC, NTIS [PB94-142155], and ERIC [W285].

*A Guide to the Biosolids Risk Assessment Methodology for the EPA 503 Rule.* USEPA Office of Wastewater Enforcement and Compliance. EPA/832-B-93-005. To be available late in 1994 from OWRC.

***Technical Support Document for Land Application of Sewage Sludge, Volumes 1 and 2.*** USEPA Office of Water. Available from NTIS [PB93-110575 and PB93-110583] and ERIC [D734 and D735].

***Technical Support Document for Surface Disposal of Sewage Sludge.*** USEPA Office of Water. Available from NTIS [PB93-110591] and ERIC [D757].

***Technical Support Document for Incineration of Sewage Sludge.*** USEPA Office of Water. Available from NTIS [PB93-110617] and ERIC [D756].

***Technical Support Document for Reduction of Pathogens and Vector Attraction in Sewage Sludge.*** USEPA Office of Water. Available from NTIS [PB93-110609] and ERIC [D755].

***Guidance for Writing Case-by-Case Permit Requirements for Municipal Sewage Sludge.*** USEPA Office of Wastewater Enforcement and Compliance. May 1990. Available from NTIS [PB91-145508] and ERIC [W126].

***Guidance for Writing Permits for the Use or Disposal of Sewage Sludge.*** Draft. USEPA Office of Wastewater Enforcement and Compliance. Available from ERIC [W114]. Final available from OWRC late in 1994.

***Preparing Sewage Sludge for Land Application or Surface Disposal: A Guide for Preparers of Sewage Sludge on the Monitoring, Record Keeping, and Reporting Requirements of the Federal Standards for the Use of Sewage Sludge, 40 CFR Part 503.*** USEPA Office of Wastewater Enforcement and Compliance. EPA/831-B-93-002a. September 1993. Available from NTIS [PB94-102415], ERIC [W267], and OWRC.

***Sewage Sludge Sampling Video.*** USEPA Office of Wastewater Enforcement and Compliance. 1993. Available from OWRC or Regional EPA Sewage Sludge Coordinators.

***Land Application of Sewage Sludge: A Guide for Land Appliers on the Record Keeping and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge, 40 CFR Part 503.*** USEPA Office of Wastewater Enforcement and Compliance. EPA/831-B-93-002b. May 1994 Available from NTIS, ERIC, and OWRC.

***Surface Disposal of Sewage Sludge: A Guide for Owners/Operators of Surface Disposal Facilities on the Monitoring, Record Keeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge, 40 CFR Part 503.*** USEPA Office of Wastewater Enforcement and Compliance. EPA/831-B-93-002c. May 1994. Available from NTIS, ERIC, and OWRC.



## Other Literature


Ryan, J. A., and R. L. Chaney. 1992. ***Regulation of Municipal Sewage Sludge Under the Clean Water Act Section 503: A Model for Exposure and Risk Assessment for MSW-Compost.*** In Science and Engineering of Composting, Hoitink and Keener, ed. Renaissance Publications, Worthington, OH. 1993.

Chaney, R. L. and J. A. Ryan. 1992. ***Heavy Metals and Toxic Organic Pollutants in MSW-Composts: Research Results on Phytoavailability, Bioavailability, Fate, Etc.*** Ibid.

Chaney, R.L. and J.A. Ryan. 1994. ***State of the Art in Evaluating the Risks of As, Cd, and Pb in Urban Soils for Plants, Animals, and Humans.*** Proc. Conf. Criteria for Decision Finding in Soil Protection: Evaluation of Arsenic, Lead, and Cadmium in Contaminated Urban Soils (Oct. 9-11, 1991; Braunschweig, FRG). In Press.


## Specialists to Contact

***Beneficial Use of Biosolids***

| | |
|---|---|
| Dr. John Walker | 202-260-7283 |
| Mr. Robert Bastian | 202-260-7378 |

***Risk Assessment***

| | |
|---|---|
| Dr. Jim Ryan | 513-569-7653 |
| Dr. John Walker | 202-260-7283 |

***Risk Assessment and Derivation of the Rule***

| | |
|---|---|
| Mr. Robert Southworth | 202-260-7157 |
| Mr. Alan Hais | 202-260-1306 |

***Permitting***

| | |
|---|---|
| Ms. Wendy Bell | 202-260-9534 |
| Ms. Wendy Miller | 202-260-3716 |

***Compliance Monitoring and Enforcement***

| | |
|---|---|
| Mr. Joe Theis (Enf.) | 202-260-8185 |
| Mr. George Gray (Cpl.) | 202-260-8313 |

***Sampling and Analysis***

| | |
|---|---|
| Ms. Cristina Gaines | 202-260-6284 |
| Mr. Joe Theis | 202-260-8185 |

***Publications***

| | |
|---|---|
| Ms. Sharie Centilla | 202-260-6052 |
| Ms. Bernita Starks | 202-260-7287 |

## Regional Coordinators to Contact for Permitting and Other Issues Pertaining to Ongoing Biosolids Use or Disposal Activities

**Region 1**
Thelma Hamilton
JFK Federal Bldg (WMT-2111)
One Congress St.
Boston, MA 02203
617-565-3569

**Region 2**
Alia Roufaeal
26 Federal Plaza
New York, NY 10278
212-264-8663

**Region 3**
Ann Carkhuff
(3WM55)
841 Chestnut St.
Philadelphia, PA 19107
215-597-9406

**Region 4**
Vince Miller
345 Courtland St., NE
Atlanta, GA 30365
404-347-3012

**Region 5**
Ash Sajjad
(WQP-16J)
77 West Jackson
Chicago, IL 60604
313-886-6112

**Region 6**
Stephanie Kordzi
(6-WPM)
1445 Ross Ave., #1200
Dallas, TX 75202-2733
214-665-7520

**Region 7**
John Dunn
726 Minnesota Ave.
Kansas City, KS 66101
913-551-7594

**Region 8**
Bob Brobst
(8WM-C)
999 18th St., Suite 500
Denver, CO 80202-2405
303-293-1627

**Region 9**
Lauren Fondahl
75 Hawthorne St., (W-5-2)
San Francisco, CA 94105
415-744-1909

**Region 10**
Dick Hetherington
(WD-134)
1200 Sixth Ave.
Seattle, WA 98101
206-553-1941

EPA

(4204)
United States
Environmental Protection Agency
Washington, DC 20460

Official Business
Penalty for Private Use $300

Attachment M

# L. J. WADLEIGH FARM

280 SCHOOL STREET
TILTON, N.H. 03276-5756

Senate Committee on Environment
State House Office Building
State Street
Concord, N.H. 03301

May 5, 1999

Re: SB 218

Dear Sirs:

The Lewis J. Wadleigh farm is a fifth generation family farm. Many years ago it was considered one of the most modern farms around. Unfortunately it has never quite recovered from the depression and some bad investments. The five children of Lewis and Winifred Wadleigh hope to restore the farm to its past stature.

An integral part of the restoration requires fertilization of the fields. If biosolids are acceptable, we had hoped to use it as an inexpensive source of both nutrients and organics.

We are of the opinion that the experts in the NHDES and EPA have the knowledge and expertise to determine the safety of biosolids.

We therefore strongly support HB 504, HB 222 and HB 546.

We oppose HB 335, HB 334, HB 472 and HB 504.

It seems rather peculiar that we trust our inspectors to determine and protect the safety of prescription drugs, meats, fruits, vegetables and even the air we breath, yet we question their integrity to determine the safety of biosolids.

Thank you for your careful consideration of this extremely important subject.

Nicholas Wadleigh
Sara Allesbury
Julia Dyker
David Wadleigh
Ben Wadleigh

218 FN-L
Attachment N

**Ralph Kirshner**
**16 Whortleberry Island**
**Center Harbor, NH 03226**

**voice/fax : 603-569-1517**
**email: rmk25@cornell.edu**

31 March 1999

Dear Senate Environment Committee Members:

As I will be unable to testify in person at the hearing on April 1 on SB 218, regulating the land application of sewage sludge, I would like to submit the following written testimony.

As I have told the Committee on other occasions, as an island resident using Lake Winnipesaukee for drinking water, I am personally concerned with issues affecting water quality. I therefore support SB 218.

The U.S. Clean Water Act, first passed in 1972, changed the way we deal with human waste. Congress mandated and funded new sewage treatment plants, which concentrated this waste into sewage sludge, or "biosolids" as the U.S. Environmental Protection Agency redefined it in 1992. Whatever the term used, its disposal is still a problem.

The EPA banned ocean dumping of sludge in 1991. New York City now ships trainloads to Texas and other states; Mayor Giuliani recently characterized his city's waste exporting as a form of cultural exchange. New Hsampshire is a lot closer to New York City than Texas. Without adequate regulation, we will be taking a large load off the Mayor's mind.

Other states, including Massachusetts, have enacted strict regulations on land disposal in their own states, preferring to ship it elsewhere, including New Hampshire. The EPA has reclassified some types of sludge from hazardous material to fertilizer, allowing its application on farmland and forests. The term "biosolids" also includes paper mill waste, also shipped and spread here. Paper reclassifications do not change real paper product pollution.

Human waste has been used as fertilizer for thousands of years, but sludge is a contentious issue. The questions are not only esthetic. Sludge can contain toxic chemicals, disease-causing organisms, poisonous heavy metals like lead, and even radioactive compounds, in addition to fertilizer components like nitrates and phosphates that can be harmful if they pollute surface or groundwater. Unfortunately, sewers are often used for the disposal of materials other than wastewater, and many citys have combined storm drains and sanitary sewers, where anything washed off the streets ends up in the sludge. The EPA regulates only 21 of the tens of thousands of possible pollutants in sludge, not including some like dioxins and pcb's which are known problems; this bill begins to address them.

The New Hampshire Department of Environmental Services, which is responsible for regulation, is also a major producer of sludge from the Winnipesaukee River Basin plant it runs in Franklin, which treats sewage from Moultonboro, Center Harbor, Meredith, Laconia, Gilford, and other neighboring communities. Some of this is spread on pastureland and cropland in Franklin and elsewhere. Many farmers welcome the stuff; as fertilizer it is either free or they are paid to take it. Some, however, claim their cattle have been poisoned by heavy metals, and neighbors downwind have also reported serious heath problems. New Hampshire is also one of the few places to allow sludge to be used for reclaiming gravel pits, a practice opponents warn has severe potential for contaminating underlying aquifers and drinking water supplies.

(more)

I understand that Senator Wheeler is submitting an amendment to SB 218 to end this practice, and I also support that amendment. If DES paid attention to paragraph I of RSA 155-E:5, there would be no need for it. RSA 155-E:5, I begins: "Except for exposed rock ledge, all areas which have been affected by the excavation or otherwise stripped of vegetation shall be spread with topsoil or strippings, if any, but in any case covered by soil capable of sustaining vegetation..."

Please note that reclamation is supposed to be done with "topsoil or strippings" and "soil capable of sustaining vegetation," NOT SLUDGE! Sludge is not soil!

DES, however, has twisted the law to allow it to dispose of the sludge it produces from the Winnipesaukee River Basin Project, polluting our groundwater. A DES conflict of interest once again has been resolved in favor of bureaucratic rump covering rather than the public interest.

In fact, if DES adequately enforced RSA 485:17 which makes pollution a crime, there would be less need for this whole bill. That law says that anyone placing **ior near** surface waters "any substance or fluid that **may** cause such water to become impure" is committing a misdemeanor felony (emphasis added). Since virtually everywhere in the state is near a "stream tributary thereto" of surface waters, and since almost nobody denies that sludge **may** cause pollution, why are we spreading it?

The answer is obvious: sludge is big business in this state. SB 218 is actually less restrictive than current law (RSA 485:18) if it were enforced. The State House is showing signs of yet another political mire. Please pass this bill and help us out of it.

Sincerely,

Ralph Kirshner

Attachment O

**TESTIMONY**
**Senator Disnard**
**SB218-FN-LOCAL**
**May 6, 1999**

**Thank you Mr. Chairman and members of the committee. For the record, I am Senator George Disnard and I represent District 8. I am here to testify in support of SB218 with the amendment proposed by Senator Wheeler.**

**When discussing the land application of sludge, individuals are quick to argue that sludge is a valuable substance that provides nutrients for farmers growing crops. What these individuals often fail to mention is that sludge contains contaminants that are not removed by wastewater treatment. It is important to consider the long-term impact of these contaminants and how they will effect public health and our environment.**

**As a former member of the NH Fish and Game Commission, I have real concerns about the land application of sewage sludge. The provisions put forth in SB218 will reduce the risks to human health, to live stock, and to the environment from the land spreading of sludge. This bill establishes buffer distances from high water marks, does not allow the use of Class B sludge or industrial paper mill sludge to reclaim spent gravel pits above aquifers, and does not allow the application of Class B sludge to forestland. SB218 also includes many other sludge regulations that will serve to maintain safe water quality and ensure the protection of our environment. I urge the committee to pass this important piece of legislation. Thank you.**

Repowen
Attachment D

Senator Russman
Chair: Senate environmental Comm.

April 15, 1999

Senator Russman:

As a NH certified organic producer I am very concerned about the land application of bio solids without long-term studies of possible effects.

our future as a nation depends on our ability to produce our own, healthy and nutritious food. Is it short-term solution to a very complex problem worth the risk?

Sincerely,

Kathie Spoto
Avonlea Farm
Hopkinton, NH

From Kathie Jan 83 218

### Picograms to Nanograms

A nanogram is 1,000 times larger than a picogram. How does the intake of dioxin, which is measured in picograms, turn into a body burden level of dioxin that is measured in nanograms? Dioxin is broken down very slowly. So we ingest new dioxin more quickly than we break down what's already in our bodies. We accumulate more and more dioxin, and with the passage of time, the picograms we eat in our food build up into nanograms stored in our bodies.

additional cancer for every 1 million exposed people, if that exposure occurs over a seventy-year lifetime.

Based on this "safe" dose, everyone is consuming too much dioxin. The EPA estimates the average intake of dioxin for the general population is 119 pg/day. This is more than 280 times the EPA's safe dose of 0.42 pg/day. This value poses a cancer risk in the range of 1 in 10,000 to 1 in 1,000, which is 100 and 1,000 times higher, respectively, than the normal "acceptable" risk level of 1 in 1 million. This is one of the highest cancer risk levels ever reported. Other, non-cancer, effects of dioxin are not considered in this risk calculation.

## A "Safe" Body Burden of Dioxin

Because dioxin is so stable and has such a long half-life (seven to eleven years) in the body, we accumulate dioxin over our lifetimes. The EPA calculated the average level of dioxin in the body to be 9 nanogram per kilogram (ng/kg), or 9 parts per trillion (ppt). (Also see conversion chart in Appendix B.) This is an average level for a middle-aged person. Some people will have higher levels and some lower; in general, younger people will have lower levels and older people will have higher levels.

Using a number of studies in both animals and humans (many of which are reviewed in subsequent chapters), the EPA





*Table 5-1*

**Levels of Dioxin Known to Cause Health Problems**

| Body Burden (ng/kg) | Species | Health Effect |
|---|---|---|
| 7 | Mice | Increased susceptibility to viruses |
| 7 | Monkeys | Altered immune response |
| 14 | Humans | Altered glucose tolerance |
| 14 | Humans | Decreased testes size |
| 19 | Monkeys | Learning disability |
| 54 | Monkeys | Endometriosis |
| 64 | Rats | Decreased sperm count |
| 83 | Humans | Decreased testosterone |

*Source: USEPA, 1994b*

calculated that the lowest body burden level that has been shown to cause harm in people is 14 ng/kg. This level is just above the average American's body burden of dioxin of 9 ng/kg. This fact is the basis of the statement, made several times in the EPA report, that "levels of dioxins are at or near the levels known to cause harm." These numbers are as disturbing and as frightening as the cancer risk assessment numbers.

If the average person has a dioxin body burden levels of 9 ng/kg, and depression of the immune system occurs at 7 ng/kg (see Table 5-1), then the body burden of the average person is not "near or at," but actually *above* the level of dioxin that has been shown to cause harm. Any further increase in dioxin will certainly be harmful.

The information in Table 5-1 immediately counters two claims made by the chemical industry and others who are trying to downplay the dioxin problem. One claim is that different species respond very differently to dioxin, and humans are among

against the Columbus trash burning power plant, requiring the plant to be retrofitted with new pollution control equipment within two years. However, the cost of the retrofit was too great, and on November 2, 1994, a unanimous vote by the Solid Waste Authority of Central Ohio closed what was possibly the largest known single source of dioxin in this country.

The people of Central Ohio can breathe easier for a while—that is, until the plant is sold to another company that wants to burn trash. Will dioxin exposure ever end? You're damn right it will, if we strive to create a unified force from the varied voices demanding a healthy and safe environment for all. Our children deserve our best efforts on their behalf.

—*Teresa Mills, PARTA*

way to estimate the body burden of dioxin was to take samples of fat tissue, which are not easy to obtain for large studies. Then scientists discovered that dioxin was carried in the fat, or lipid, part of the blood, and that dioxin in these blood lipids was in equilibrium (balance) with dioxin in fat tissue (Papke, 1989; Schecter, 1990). This was an important finding because blood is easier to obtain from people than fat. However, it still is not easy for any individual to find out his or her own body burden, because measurements cost between $1,500 and $2,500, and because there is a scarcity of laboratories equipped to carry out the measurements (Schecter, 1994a). In contrast, the body burden levels of PCBs, a dioxin-like substance, are relatively easy to measure. This costs about $75 to $125 per sample, and many laboratories can do the measurement (Schecter, 1994b).

## Highly Exposed Groups

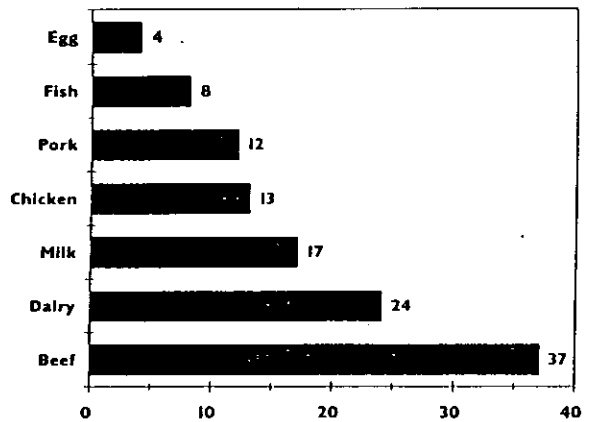
Most human dioxin exposure is through food. Since food found in the local supermarket comes from all over the United States, dioxin exposure averages out for people whose food comes off grocery store shelves. However, if a person eats a





*Figure 5-1*

**Daily Intake (pg) of Dioxin in Toxic Equivalents**




*Source: USEPA, 1994d*

great deal of local food, and if that local food is heavily contaminated with dioxin, that person can accumulate an extra high dioxin concentration. This does not apply to fruits and vegetables from your own garden, even if you have a large garbage incinerator or copper smelter in your city because of the poor uptake of dioxin by plants and vegetables. Fruits and vegetables contain negligible amounts of dioxin. It does apply to food higher up the food chain which is produced near a local dioxin source. For example, if you live on a dairy farm and consume your own milk and beef, and if there is a large source of dioxin nearby, then you are likely to be among the highly exposed.

Another highly exposed group is people who consume a lot of freshwater or coastal fish. Some people rely on fish as a main staple of their diet. If these fish are caught in lakes, rivers, or streams that are contaminated with dioxin, these people risk high levels of dioxin toxicity. This is especially true for rivers that are downstream from a paper or pulp mill. In Maine, for example, fisherman are advised to eat no more that two fish meals a year

*Table 5-2*

**Dioxin in U.S. Foods**

| Food type | Total TEQ (pg/gram food) |
|---|---|
| Ground beef | 1.5 |
| Soft blue cheese | 0.7 |
| Beef rib steak | 0.65 |
| Lamb sirloin | 0.4 |
| Heavy cream | 0.4 |
| Soft cream cheese | 0.3 |
| American cheese stick | 0.3 |
| Pork chops | 0.3 |
| Bologna | 0.12 |
| Cottage cheese | 0.04 |
| Beef rib/sirloin tip | 0.04 |
| Chicken drumstick | 0.03 |
| Haddock | 0.03 |
| Cooked ham | 0.03 |
| Perch | 0.023 |
| Cod | 0.023 |

This table shows the average level of dioxin found in different foods. By multiplying the average dioxin level in food by the average consumption rate of these foods, as shown in Table 5-3, you can estimate the level of dioxin consumed when eating these foods.

*Source: Schecter, 1994c*

from the Penobscot, Androscoggin, and Kennebec Rivers, due to high dioxin concentrations (MDEP, 1994). Ocean fish have lower levels of dioxin, but coastal fish, mussels, clams, oysters, and bottom-feeding fish have higher levels of dioxin due to pollution of the coastal sediments.

People who live in a community contaminated by a local dioxin source are at even higher risk of suffering one of the many health problems caused by dioxin. People living in dioxin-contaminated communities such as Times Beach, Missouri; Jacksonville, Arkansas; and Pensacola, Florida; are exposed to dioxin leaking from contaminated sites located in these communities. The exposures that result from living near dioxin-contaminated sites add to the general exposure that these people receive from food.





*Table 5-3*

**U.S. Consumption Rate for Various Food Groups**

| Food group | Consumption rate (gm/day) | Low range of dioxin (pg/gm) | High range of dioxin (pg/gm) |
|---|---|---|---|
| Fruits and vegetables | 283 | | |
| Milk | 254 | 0.04 | 0.04 |
| Beef | 88 | 0.04 | 1.50 |
| Other dairy products | 55 | 0.04 | 0.70 |
| Poultry | 31 | 0.03 | 0.03 |
| Pork | 28 | 0.03 | 0.30 |
| Fish | 18 | 0.02 | 0.13 |

*Source: Schecter, 1994c*

## Sources of the Daily Dose of Dioxin

The family of dioxin-like chemicals enters the body almost entirely through the food chain. The EPA report concludes that 90 percent of the dioxin people are exposed to comes from the food they eat. In trying to assess the risk of consuming dioxin in food, the EPA determined the average "daily intake" of dioxin. Since dioxin and dioxin-like chemicals are contained in fat (and, to some extent, in liver), we are exposed primarily through ingestion of fat in meat, milk, cheese, eggs, and fish. Two different estimates of daily intake have been made, which agree reasonably well with one another. The first is the intake estimated by the EPA, shown in Figure 5-1.

The EPA estimated that the average 150-pound adult ingests 119 picograms of dioxin per day. About 95 percent of this comes from beef, chicken, pork, fish, and dairy products such as cheese, milk, and eggs. Vegetables, fruit, grains, and water contain negligible amounts of dioxin.

*Table 5-4*

**Dioxin Equivalents Consumed Each Day at Different Ages**

| Age | pg/kg/day |
|---|---|
| Breast-fed infant | 34–53 |
| Formula-fed infant | 0.07–0.16 |
| 1–4 | 1–32 |
| 5–9 | 1–27 |
| 10–14 | 0.7–16 |
| 15–19 | 0.4–11 |
| Adult >20 | 0.3–3 |

*Source: Schecter, 1994c*

The EPA's values for average dioxin intake are based on the average dioxin levels in food multiplied by the average food consumption. For example, the average daily intake of dioxins through fish is low because average fish consumption in the U.S. is low. However, averages can be misleading. For example, some freshwater and coastal fish contain much higher levels of dioxin, especially when caught downriver from a dioxin source. In Maine, fish caught downstream from a pulp and paper mill had between 2 and 3 pg/gm dioxin (MDEP, 1994). This level is consistently higher than the average dioxin level found in ground beef, as shown in Table 5-2.

The second estimate of dioxin levels in U.S. foods comes from the work of Dr. Arnold Schecter of the Department of Preventive Medicine at the State University of New York at Binghamton. Dr. Schecter conducted one of the few surveys in the U.S. of dioxin levels in foods taken off supermarket shelves (Schecter, 1994c). Based on this work, Schecter calculated that the range of dioxin intake for an adult to be between 0.3 and 3 pg/kg/day. To compare this estimate to the EPA's estimate, multiply each number by 65 (the size of the "standard" person; equal to 143 pounds) to obtain 18 to 192 pg/day—in good agreement with the EPA's average estimate of 119.

These estimates of the daily intake of dioxin in the United States are similar to estimates made for the Swedes, the Dutch, the English, and everyone else whose diet has been tested for dioxin (Beck, 1994; Patterson, 1994; Schecter, 1994). Even groups who live





in remote places take in dioxin. The Inuit people of northern Canada have a high intake of dioxin and PCBs due to the fact that their primary diet is composed of fish, seal, and whale, all animals high in the food chain and high in fat (Dewailly, 1994).

Schecter also examined typical food consumption at various ages and calculated the daily consumption of dioxin for different age groups, as shown in Table 5-4.

All of these values substantially exceed the EPA "safe" dose of 0.006 pg/kg/day, which is very disturbing. The average daily intake of dioxin in breast milk is at least ten times higher than the average daily intake for an adult. More alarming, however, is the fact that after one year of nursing the daily intake for breast-fed infants is ten times the EPA "safe" dose, which is based on a lifetime of exposure. Because people are at the top of the food chain, the dioxin content in breast milk is higher than in any other food. Breast feeding has wonderful health benefits, as well as psychological benefits, to baby and mother. But breast milk also has dioxin, posing an agonizing choice for each nursing mother. This is a choice no parent should have to face, and steps must be taken to stop dioxin exposure and reduce the levels of dioxin in breast milk. (Breast milk and dioxin is discussed in greater detail in Chapter 8, "Dioxin and Reproduction.")

Dioxin is a very serious environmental problem. The solutions are both personal and political. On an individual level, it will help to eat less fat of animal origin. Skim milk is better than whole, lean meat better than fatty, skinless chicken better than whole. But there is no way for us, as individuals, to completely eliminate dioxin from our food and our lives. Steps must be taken to stop dioxin exposure by stopping the production and release of dioxin. No one has the right to poison our food supply.

## Contributors

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signal that the body sends out when testosterone levels are low. In the study of Operation Ranch Hand veterans, those with the highest dioxin levels had the lowest testosterone levels, and had four times as many "unspecified testicular abnormalities" as did members of the control group (Roegner, 1991).

## Decreasing Sperm Count

Several studies have shown that men today have about half the sperm count of their fathers (Carlsen, 1992; Irvine, 1994; Auger, 1995). The cause for this is not known, but several of these studies indicate that exposure to chemicals that act like hormones have interfered with normal hormone functions that control sperm production. Certain chemicals have been shown to lower sperm counts in animals and in exposed workers. In animal studies, dioxin (Mably, 1991; Nadler, 1969; Sedersten, 1978) and the pesticide endosulfan (Gupta, 1979; Singh, 1990) lowered testosterone levels and produced testicular atrophy in male rats. And chemicals such as dioxin (CDC, 1988b), kepone (Guzelian, 1982), 2,4-D (Lerda, 1991), and dibromochloropropane (Whorton, 1983) have been shown to reduce sperm count in men.

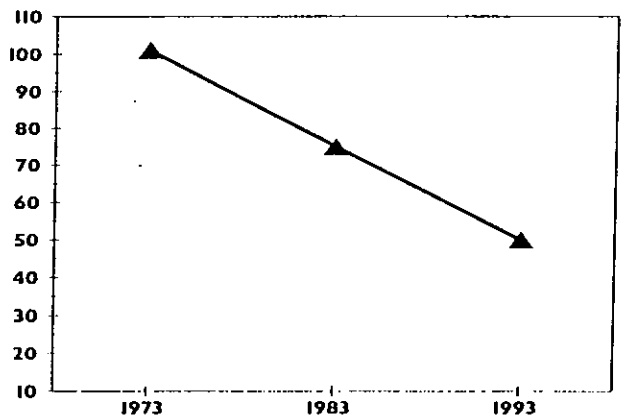
The decreased sperm count in men has been noted in several scientific reports, but up until 1992, none of these studies were convincing by themselves. Then, a group of Danish researchers used a statistical technique called "meta-analysis" to combine the results of all the studies. Meta-analysis is a statistical technique that allows one to combine many separate scientific studies to determine an overall effect. For example, suppose that one study of 50 men showed a 10 percent increase in sperm count, but another study of 1,500 men showed a 10 percent decrease. Instead of concluding that one study shows an increase and a second study contradicts the first, meta-analysis combines the studies to determine the average change in sperm count in all 1,550 men. The Danish researchers reviewed sixty-one published studies of nearly 15,000 European men and found that between 1938 and 1990, sperm count had decreased by 50 percent in one generation (Carlsen, 1992). Scientists hesitated to accept this conclusion, as





*Figure 8-1*

**Decreasing Sperm Count in Men Aged 27-38 for 20-Year Period 1973-1993, in Millions Per Milliliter**




*Source: Auger, 1995*

the meta-analysis combined studies conducted in different countries at different times using different techniques.

Then, in 1995, a study was published that convinced many skeptics (Auger, 1995). One sperm bank in Paris that had been in existence for over twenty years examined the sperm count, sperm motility, and percentage of abnormal sperm in 1,351 healthy men. The sperm bank had detailed information on the age of each donor and the days of abstinence before donating sperm. The techniques for counting sperm had not changed over the twenty-year period. According to this study, sperm count, sperm motility, and the percent of normal sperm all decreased over the twenty-year period (1973 to 1992). The average sperm count declined by 2.1 percent per year from 89 million per milliliter (ml) in 1973 to 60

by the children exposed to PCBs and dioxins from contaminated rice oil used for cooking in the Yusho and Yu-Cheng incidents (Porterfield, 1994).

## Diabetes

Dioxin interferes with the hormone insulin, alters glucose tolerance, and can lead to diabetes. In one study of fifty-five exposed workers evaluated ten years after exposure, 50 percent of the workers were diabetic or had abnormal glucose tolerance tests, an early sign of diabetes (Pazderova-Vejlupkova, 1981). Due to this remarkable finding, several other studies examined either abnormal glucose levels or diagnosed cases of diabetes in dioxin-exposed populations. Although the results vary from study to study, the most reliable studies consistently show that dioxin increases the risk of diabetes. In the NIOSH study, for example, the risk of diabetes increased 12 percent for every 100 picogram dioxin/gram (pg/g) of lipid in the blood (Sweeney, 1992). In the Ranch Hand study, veterans with blood dioxin greater than 33.3 pg/g had a relative risk of 2.5 for diabetes (Roegner, 1991).

In the EPA report, the agency expressed considerable concern that no animal studies showed increases in plasma glucose with dioxin exposure. Such a lack of correlation between animal studies and humans is a cause for concern. However, there is a rather simple explanation for the difference. Animal diets are low in fat—usually between 8 percent and 15 percent fat—and this fat is unsaturated: human diets, in contrast, contain between 30 percent and 50 percent fat, with a high proportion of saturated fat. If animals were fed a diet comparable to humans, and then tested for the effects on plasma glucose and diabetes, the discrepancies between human and animal studies might disappear. Dioxin simply has not yet been tested under the same dietary conditions for both animals and humans.





*Table 9-1*

**Neurological Symptoms Reported After Dioxin Exposure**

- headaches
- dizziness
- irritability
- depression
- insomnia
- tremors
- numbness
- anorexia
- muscle weakness
- nervousness
- anxiety
- crying spells
- apathy, fatigue
- slowed thinking
- social withdrawal
- trouble concentrating
- reduced sex drive
- difficulties with erection
- decreased mental efficiency
- depression
- loss of feeling in extremities
- tingling in toes and fingers
- slowed nerve conduction velocity

*Source: USEPA, 1994a*

## The Nervous System

Dioxin causes neurological damage in animal studies. Many case reports or studies of dioxin-exposed people also show damage to the central nervous system or the peripheral nervous system, as shown in Table 9-1.

The EPA concluded, after reviewing all the neurological reports, that high exposure to dioxin causes neurological damage, but that these effects are short-lived. According to the EPA, studies conducted long after exposure ended, such as those on the Ranch Hand veterans, Seveso residents, or exposed chemical workers, indicate that neurological damage does not persist.

But the data in these reports is not consistent with the EPA's statement. In our reading of the studies, neurological damage persisted in some adults for ten years, especially in the chemical workers (Pazderova-Vejlupkova, 1981). The toxicity of dioxin to the developing nervous system might be more severe and could be permanent. The pregnant women who ate contaminated rice oil in Yu-Cheng had babies that were developmentally delayed

*Table 9-2*

**Overall Health Effects Associated with Dioxin and Dioxin-like Chemicals**

*Cancer:*

- Soft or connective tissue, lung, liver, stomach, Non-Hodgkin's lymphoma

*Male reproductive toxicity:*

- Reduced sperm count
- Testicular atrophy
- Abnormal testis structure
- Decreased testis size
- Decreased sex drive
- Alterations in male hormone levels—decreased testosterone, androgen; increased follicle-stimulating hormone (FSH) and leutinizing hormone (LH)
- Feminization of hormonal and behavioral responses

*Female reproductive toxicity:*

- Hormonal changes
- Decreased fertility
- Adverse pregnancy outcomes—miscarriages; inability to maintain pregnancy
- Ovarian dysfunction—suppression of the estrous cycle, anovulation of the menstrual cycle
- Endometriosis

*Effects on unborn fetus:*

- Birth defects—cleft palate, hydronephrosis
- Alterations in reproductive system
- Decreased sperm count
- Altered mating behavior
- Structural abnormalities in female genitalia
- Reduced fertility
- Delayed puberty
- Neurological problems
- Developmental problems

*Skin disorders:*

- Chloracne
- Hyperpigmentation
- Eye lid cyst
- Hypertrichosis
- Actinic keratosis
- Peyronie's disease
- Hirsutism

*Metabolic and hormonal changes including:*

- Altered glucose tolerance and decreased insulin levels leading to increased risk of diabetes
- Altered fat metabolism leading to elevated lipids, cholesterol and triglycerides, and increased risk of heart disease
- Altered porphyrin metabolism leading to porphyria cutanea tarda (PCT) and elevated urinary porphyrins including uroporphyrin, urobilinogen, coproporphyrin
- Weight loss, wasting syndrome
- Changes in thyroid hormones

*Damage to central and peripheral nervous systems leading to:*

- Increased irritability and nervousness
- Decreased pin prick sensation
- Impaired neurological development and subsequent cognitive deficits

*Damage to liver as measured by*

- Elevated Gamma Glutamyl Transferase (GGT) levels
- Enlarged liver
- Elevation of liver enzymes other than GGT (LDH, AST, ALT and D-glucaric acid
- Cirrhosis

*Damage to the immune system leading to:*

- Reduced size of thymus
- Increased T-4 cells
- Increased ratio T-4 to TBG cells
- Increase susceptibility to infectious disease
- Increased risk of cancer

*Lung problems:*

- Irritation
- Tracheobronchitis
- Decreased lung function

*Other gastrointestinal damage leading to:*

- Loss of appetite
- Nausea
- Damage to heart leading to circulatory disorders and heart disease

*Source: USEPA, 1994a, 1994b; DeVito, 1994*





in the study on Ranch Hand veterans. Those veterans with the highest serum dioxin levels had reduced lung function (Roegner, 1991). These changes were small, but statistically significant.

## Conclusions

The EPA examined the evidence of each of the health effects of dioxin, taking into account the number of scientific studies, the quality of the studies, the sequence of events (exposure and appearance of illness), the degree of exposure, the consistency among studies, and biologic plausibility (whether the disease

In 1986, Vertac declared bankruptcy and willed its ninety-three-acre site to the people of Arkansas. Vertac's executives abruptly left town and have never been successfully traced. The *New York Times* said, "Vertac abandoned the plant leaving behind roughly 30,000 barrels of chemical wastes, along with acres of contaminated soil, tanks filled with toxic materials, and miles of poisonous piping. The EPA considers the site one of the country's worst hazardous waste sites, not only because of [the] extent of the contamination but also because the plant is only a few blocks from a day care center, a hospital, and hundreds of houses."

By 1989 state and federal officials had made firm plans to build the incinerator to burn some 22 million pounds of Vertac's dioxin-laced wastes. On at least two occasions a majority of the citizens of Jacksonville expressed, through referendums and public meetings, the fact that they did not want the incinerator built. Many local people considered it a dirty, dangerous way to "get rid of" the wastes. They pointed out that cleanup teams had already packed the 30,000 barrels in special drums, which were not an immediate threat. The real threat was the wastes already released into the community, the ground, and the groundwater. State and federal officials ignored these expressions of sentiment, turned a blind eye to alternative technologies, and forged ahead with their plan to burn the visible evidence—to make Jacksonville look clean again. The real cleanup of soil and water would have to wait for a later time.

At public meetings throughout 1989 and 1990, state and federal environmental officials insisted repeatedly that the Vertac site incinerator would emit zero dioxin into the surrounding community.

A trial burn was conducted during October 1991. State and federal officials examined the data and declared the incinerator a resounding success. But Greenpeace chemist Pat Costner analyzed the trial burn data and published her own analysis, showing that the incinerator had not achieved the required 99.9999 percent destruction of the wastes, but had in fact achieved only 99.96 percent destruction. This meant that the incinerator was releasing

and police can't control crime, and demagogues use fear and prejudice to promote misguided "quick fixes" for complicated social problems. When people organize themselves to protect their communities from further dioxin contamination, they're also fighting back against the alienation and isolation that destroys the promise of democracy.

## The Government Won't Stop the Poisoning, But Organizing Will

In a true representative democracy, we would expect that an agency set up to protect the environment would do just that. But today, the United States Environmental Protection Agency protects the right to pollute. This is another reason we must organize to protect ourselves against dioxin exposure—because no one else will do it for us.

The EPA's recommended water quality standard to protect aquatic life and preserve streams and lakes is .013 parts of dioxin per quadrillion (quadrillion equals 1,000,000,000,000,000). For safe drinking water, the recommended standard is 30 parts per quadrillion.

How can the EPA justify setting a standard for lakes and streams that is 2,000 times stricter than the standard for people? The answer is that setting standards is not about good science and the facts. It's about the corporations' pressure on government agencies to protect their financial interests. It's about "public" comment periods that are dominated by corporate scientists and consultants, public relations firms and lobbyists; it's about an agency that is pressured to justify every step with a level of scientific proof or certainty that has no place in a regulatory arena.

The proposed standards for medical and municipal waste incinerators are another example of the EPA's primary role as a permitter of—not a protector against—poisoning. Although the EPA recognizes that these types of incinerators are two of the greatest sources of dioxin in the country, the EPA's proposed standards "to protect public health" simply *limit* emissions by requiring air pol-

*Table 14-4*

**Dioxin Released from the Disposal of Sewage Sludge in Grams of Toxic Equivalents/Year**

| Disposal Method | Amount of Dioxin Released |
|---|---|
| Land application | 86 |
| Landfill | 99 |
| Incineration | 23 |
| Surface disposal | 20 |
| Sold as fertilizer | 4 |
| TOTAL | 232 |

*Source: USEPA, 1994d*

## Wastewater Treatment Plants

Sewage sludge generated by wastewater treatment plants contains dioxin. Possible sources of dioxin in the wastewater stream are industrial and small business discharges into the sewer system, storm runoff that contains dioxin deposited from the air, household wastewater, or chlorination processes in the sewage treatment plants themselves. The EPA has identified household wastewater as a source of dioxin, but it is unclear how important this source is. One study found that almost all the dioxin in household wastewater comes from washing clothes colored with dyes that contain dioxin, wash and wear cottons, and cottons with randomly high dioxin from being sprayed with pesticides (Horstmann, 1994). The EPA provided no information on the role of chlorine bleach in the formation of dioxin in household wastewater. Some evidence indicates that household chlorine bleach is contaminated with dioxin, and contributes to dioxin in household wastewater (Thornton, 1995).

About 5.4 million dry metric tons of sewage sludge are produced each year. The disposal of this sludge releases about 232 grams TEQ per year of dioxin. As shown in Table 14-4, most of this waste is spread on land or landfilled. Although only a small amount of sewage sludge is burned, the 199 sludge incinerators in the United States release an estimated 23 grams per year TEQ of dioxin, a significant amount. Some sewage sludge containing dioxin is sold





and marketed as "compost." Some is spread on farmland, which causes surface and groundwater contamination, dust dispersion, and volatilization into the air. Cows or other animals grazing on this farmland can also become contaminated with dioxin, which can come back to us in our food. The dioxin in sewage sludge that is landfilled or burned can also re-enter the environment.

## Coal Burning

Coal accounts for 25 percent of energy production in the United States. Dioxin emissions result from coal burning because of chlorine present in coal. No measurements of dioxin emissions from coal burning have been made in the U.S. and the EPA made no estimate in their report. Testing at one European facility showed no dioxin in the emissions, but the procedure used in this test was not very sensitive. Assuming that dioxin levels must be lower than this test was able to detect, the amount of dioxin released from coal burning could be no more than 300 grams TEQ per year. Cohen *et al* estimated dioxin emissions from coal burning to be 200 grams TEQ per year (Cohen, 1995).

## Motor Vehicle Fuel

According to EPA estimates, burning gasoline and diesel fuel produces considerable amounts of dioxin. The EPA estimated that 97 percent of the dioxin emissions from motor vehicles came from burning diesel fuel. Burning leaded gasoline, which is no longer used in the United States generates higher dioxin emissions than burning unleaded gasoline. Leaded gasoline contained "scavengers" that include chlorine, such as dichloroethane or pentachlorophenate. The role of these scavengers was to make the lead more volatile and thus easier to escape the engine before it caused damage. In the U.S., leaded gasoline was phased out starting in the mid-1970s to reduce human exposure to lead,

rings in the same plane are called coplanar, and these are much more toxic than the others.

## Contributors

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# Appendix B

# Conversion Charts

*Table B-1*

**Converting from One Parts Per Unit to Another**

| Original Unit | New Unit | | | |
|---|---|---|---|---|
| | ppm | ppb | ppt | ppq |
| ppm | | 1,000 | 1,000,000 | 1,000,000,000 |
| ppb | .001 | | 1,000 | 1,000,000 |
| ppt | .000001 | .001 | | 1,000 |
| ppq | .000000001 | .000001 | .001 | |

*ppm = parts per million*
*ppb = parts per billion*
*ppt = parts per trillion*
*ppq = parts per quadrillion*

*Table B-2*

### Conversion Factors for Concentrations in Solids

This table can be used to convert many of the different units used in this book. To use this chart, look down the column on the left to find the denominator of the unit you want to convert (the denominator of mg/kg is kg; the denominator of ng/mg is mg). Then go across the row to the original unit (mg/kg). Next go to the bottom half of the column to find the appropriate conversion factor for whichever unit you wish to convert (1 ppm).

| Denominator | Original Units | | | | |
|---|---|---|---|---|---|
| kilogram (kg) | g/kg | mg/kg | ug/kg | ng/kg | pg/kg |
| milligram (mg) | ug/mg | ng/mg | pg/mg | fg/mg | ag/mg |
| microgram (ug) | ng/ug | pg/ug | fg/ug | ag/ug | |
| nanogram (ng) | pg/ng | fg/ng | ag/ng | | |
| picogram (pg) | fg/pg | ag/pg | | | |
| femtogram (fg) | ag/fg | | | | |
| attogram (ag) | | | | | |
| | Conversion Factors | | | | |
| | 1000 ppm | 1 ppm | .001 ppm | .000001 ppm | .000000001 ppm |
| | 1000000 ppb | 1000 ppb | 1 ppb | .001 ppb | .000001 ppb |
| | 1000000000 ppt | 1000000 ppt | 1000 ppt | 1 ppt | .001 ppt |
| | 1000000000000 ppq | 1000000000 ppq | 1000000 ppq | 1000 ppq | 1 ppq |



## Appendix C

# Sample "Bad Boy" Ordinance

The following is a by-law prohibiting and/or regulating contracts between the town of Palmer, Massachustetts, and business entities, persons, or employees of business entities who have been convicted of bribery, attempted bribery, collusion, restraints of trade, and price-fixing.

### Section I

No person or business entity shall be awarded a contract or subcontract by the Town of Palmer if that person or business entity:

(a) Has been convicted of bribery or attempting to bribe a public officer or employee of the Town of Palmer, the State of Massachusetts, or any other public entity, including, but not limited to the Government of the United States, any state, any local government authority in the United States in that officer's or employee's capacity; or

# Center for Health, Environment and Justice

January 27, 1998

The Honorable Derek Owen
580 Brockway Road
Hopkington, NH 03229

Dear Representative Owen:

This letter is in response to your questions concerning acceptable levels of dioxin in sludge. As you and many of the citizens of New Hampshire know, hazardous materials such as dioxin and other carcinogenic substances, are emitted into the ambient air and released into waterways across the United States. The air emissions fall out onto soil including farmland and grazing land resulting in contamination of food and dairy products including human milk. Any increase or addition of dioxin or similar substances will certainly increase risks to the health of the citizens of New Hampshire.

I thought the enclosed analysis I have been working on might prove helpful in your efforts to define a safe level of dioxin in sludge. I have been evaluating the efforts of the U.S. Environmental Protection Agency to define a "background" level of dioxin in soil. What I have found is that if you only consider samples collected from areas where you would not expect to find any dioxin, a reasonable background level appears to be less than 1 part per trillion (ppt). This conclusion is based on data provided by the USEPA in their 1994 reassessment document on the health risks posed by exposure to dioxin as well as on the original papers cited in the EPA report. These studies are: (1) **The National Dioxin Study**, USEPA, Office of Solid Waste and Emergency Response, EPA/530-SW-87-025, August, 1987; (2) **Soil Screening Survey at Four Midwestern Sites,** USEPA, Region 5, EPA-905/4-85-005, June, 1985; (3) "Perspectives of a large scale environmental survey of chlorinated dioxins: overview and soil data," Nestrick, TJ, Lamparski, LL, Frawley, NN, Hummel, RA, Kocher, CW, Mahle, NH, McCoy, JW, Miller, DL, Peters, JL, Pillepich, JL, Smith WE, Tobey, SW, *Chemosphere* 15 (9-12): 1453-1460 (1986); (4) "Baseline assessment of PCDDs/PCDFs in the vicinity of the Elk River, Minnesota generating station," Reed, LW, Hunt, GT, Maisel, BE, Hoyt, M, Keefe, D, Hackney, P, *Chemosphere* 21 (1-2): 159-171 (1990); (5) "Concentrations of PCDD and PCDF in Ontario soils from the vicinity of refuse and sewage sludge incinerators and remote rural and urban locations," Pearson, RG, McLaughlin, DL and McIlveen, WD, *Chemosphere* 20:1543-1548, 1990; and (6) "Analysis of PCDD and PCDF patterns in soil samples: use in the estimation of the risk of exposure," Birmingham, B, *Chemosphere* 20 (7-9): 807-814 (1990).

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I have also reviewed the state legislative bill that proposes to restrict dioxin in sludge which states that:

> " no sludge may be spread that contains dioxin exceeding 0.5 ppt total dioxin equivalents (TEQ) for non pasture agronomic application; contains levels of dioxin exceeding 0.1 ppt total dioxin equivalents (TEQ) for reclamation application; contains any detectable levels of dioxin for pasture agronomic application."

Based on my understanding of dioxin's adverse health effects and its distribution in the environment, I find that anything short of codifying these levels into New Hampshire law would unacceptably increase exposure of the residents of New Hampshire to dioxin and other hazardous substances which would increase the risk of disease, particulary cancer. This conclusion is supported both by my analysis and the documents cited above.

I hope this information is helpful. Please feel free to contact me if you have any questions about the enclosed document.

Sincerely,

Stephen U. Lester, M.S.
Science Director

Enclosure

# YOU THINK MERCURY IS BAD - WAIT UNTIL YOU HEAR ABOUT DIOXIN!

## Without Strong Protective Policies Our Communities Continue to Be At Risk

**What is dioxin?**

- Dioxin is a name given to a group of persistent, very toxic chemicals. The most toxic form of dioxin is 2,3,7,8-tetracholorodibenzo-p-dioxin or TCDD.
- TCDD was the contaminant found in Agent Orange, at Times Beach, Missouri and at Mt. Dioxin in Pensacola, Florida. — / Love, Conn, WY.

**How is dioxin formed?**

- Dioxin is not intentionally manufactured or used. Dioxin is a by-product of many chemical, manufacturing and combustion processes.
- Some examples: Dioxin is produced when chlorine is used as a bleaching agent in making paper; when polyvinyl chloride (PVC), chlorinated pesticides and other chlorinated chemicals are manufactured; and when polyvinyl chloride (PVC) plastic, chlorinated solvents, chlorine bleached paper and other chlorinated materials are burned in incinerators.

**What are the sources of dioxin?**

- According to the EPA, two of the largest sources of dioxin are municipal waste incineration and medical waste incineration.
- Other sources include hazardous waste incineration, PVC manufacturing, pulp and paper production, cement kilns, sludge burning, petroleum manufacturing, chemical manufacturing, metal smelting, and wood and tire burning.

**How are we exposed to dioxin?**

- According to the EPA's 1994 draft dioxin reassessment, 90% of our exposure comes from the food we eat.
- In June 1998, a *Consumer Reports* article stated that an infant who ate one jar of meat-based baby food - just 2.5 ounces - would consume 100 times the EPA's daily limit of dioxin.

- When dioxin is released from the smoke stack it attaches to dust particles and can be carried thousands of miles before settling. Dioxin in air settles onto soil, water, and plant surfaces such as grass. When cows eat this grass, dioxin accumulates in their muscle and fat. People then ingest the dioxin contained in meat and dairy products. Some exposure also comes from eating dioxin-contaminated fish.

- Every man, woman and child has some level of dioxin in their bodies. This is because dioxin, like DDT, breaks down very slowly in the environment. It also accumulates in the body. Therefore, dioxin exposure is not caused by eating contaminated meat just once. Continued low level exposure leads to a "build up" in tissue.

**What are the health effects of dioxin?**

- Dioxin has repeatedly caused cancer in many different laboratory animals at very low levels. Studies in people have shown that dioxin causes increases in various forms of cancer including soft tissue sarcoma, non Hodgkin's lymphoma, and lung cancer.

- In 1997, The International Agency for Research on Cancer evaluated the evidence in humans and concluded that there was sufficient evidence to classify dioxin as a "known human carcinogen," the highest level of certainty. The EPA considers dioxin to be a probable human carcinogen.

- Dioxin is also toxic to the immune system, depressing immune response which leads to susceptibility to infectious diseases and perhaps cancer. It causes skin disorders, and at very low doses, interferes with normal reproduction and development.

- Animal studies have linked dioxin to delayed puberty, decreased fertility, birth defects, inability to maintain pregnancy, endometriosis, nerve system damage and learning disabilities.

- Human studies have shown lowered testosterone levels in exposed workers and in Vietnam veterans exposed to Agent Orange.

- In June 1998, the World Health Organization evaluated the non-cancer effects of dioxin and concluded that there was sufficient evidence to lower the "Tolerable Daily Intake" by more than half.

**EPA's Time Line for the Dioxin Reassessment:**

**1988** - EPA's begins first reassessment of dioxin.

**1991** - Then EPA Administrator William Reilly ordered the second EPA reassessment of the health effects and sources of dioxin.

**September 1993** - EPA Administrator Carol Browner informed the environmental community that the draft dioxin reassessment would be available that fall.

**September 1994** - the 2,000 page draft health and exposure documents released.

**May 1995** - the EPA's Science Advisory Board reviewed the draft reassessment report.

**September 1995** - the Science Advisory Board approved all of exposure document and seven of nine chapters in the health document. The SAB suggested some clarification and amplification of some sections of the final chapter of the health document, notably the sections that characterize the risks to people and wildlife from dioxin exposure.

**February 1996** - In a letter to the Science Advisory Board acknowledging their changes, EPA Administrator Carol Browner stated that the final reassessment would be available in September of 1996.

**1996 - Present** - the EPA has made numerous promises for when the final version of the reassessment will be released. They have broken every one of their promises.

**Conclusions:**

- The dioxin reassessment provides important information about the health effects of exposure to dioxin which is needed to protect our families and our children. Every month that goes by without a final version of the reassessment adds to the accumulating level of dioxin in the American people.

- The failure to release the final reassessment provides an excuse for industry and policy makers to continue to ignore the evidence provided in the draft reassessment and to avoid writing protective pubic policy.

- For ten years we have waited for the Environmental Protection Agency to finalize their findings on the sources and human health effects of dioxin exposure. For ten years the EPA has continued to stall, while people across the country have fought long and hard to protect their communities and families from this dangerous chemical.

- **IT IS TIME FOR THE LEGISLATURES OF NEW HAMPSHIRE TO TAKE MATTERS INTO THEIR OWN HANDS AND DEVELOP PROTECTIVE POLICIES TO PROTECT COMMUNITIES AND FAMILIES. SUPPORT HOUSE BILLS ~~334, 335, 370 & 472~~.**

-SB. 219

Rachel's **Environment & Health Weekly** #551

*Providing news and resources for environmental justice – June 19, 1997*

## TOXICS AND VIOLENT CRIME

Pollution causes people to commit violent crimes -- homicide, aggravated assault, sexual assault and robbery -- according to new research by Roger D. Masters and co-workers at Dartmouth College.[1] Sociologists have known for a long time that violent crimes occur more in some places than in others. Some U.S. counties have only 100 violent crimes per 100,000 people per year; other counties have rates of violent crime that are 30 times as high. The question is why some places have high crime rates and others don't. Masters says pollution is part of the answer.

Masters has developed what he calls the neurotoxicity hypothesis of violent crime. According to this hypothesis, toxic pollutants -- specifically the toxic metals lead and manganese -- cause learning disabilities, an increase in aggressive behavior, and -- most importantly -- loss of control over impulsive behavior. These traits combine with poverty, social stress, alcohol and drug abuse, individual character, and other social factors to produce individuals who commit violent crimes.

Masters argues that, to be taken seriously, such a hypothesis must pass five tests. He then demonstrates how the neurotoxicity hypothesis meets all five, as follows:

1) It must be shown that individuals who engage in criminal behavior are more likely to have absorbed toxic chemicals than a comparable control population. Masters cites studies showing that low-level poisoning by lead, and by manganese, is associated with learning disabilities and attention deficit disorder, which are themselves associated with deviant behavior. (We reviewed some of this evidence for lead in *REHW #529*). Masters cites seven other studies showing that violent prisoners have significantly elevated levels of lead, manganese, cadmium, mercury or other toxic metals, compared to prisoners who are not violent.

2) If it is valid, the neurotoxicity hypothesis must be able to predict future violent behavior of young people exposed to toxins. Masters cites two prospective studies (and suggests we need more) showing that lead uptake at age 7 is associated with juvenile delinquency and/or increased aggression in teenage and early adult years. (See also *REHW #529*.) The largest study, of 1000 black children in Philadelphia, showed that both lead levels, and anemia, were predictors of the number of juvenile offenses, the seriousness of juvenile offenses, and the number of adult offenses, for males.

3) Is there a biological basis for believing that lead, manganese and other toxic metals could cause a person to lose control over impulsive and aggressive behavior? Here Masters cites a wealth of studies showing how lead and manganese cause changes in the development of the brain, and in the functioning of neurotransmitters in the brain.

Different pollutants harm the brain differently. Lead in the brain damages glia, a kind of cell associated with inhibition and detoxification. Manganese has the effect of lowering levels of serotonin and dopamine, which are neurotransmitters associated with impulse control and planning. Masters notes that low levels of serotonin in the brain are known to cause mood disturbances, poor impulse control, and increases in aggressive behavior -- effects that are increasingly treated with Prozac.

Masters emphasizes that children who are raised from birth on infant formula and who are not breast fed will absorb five times as much manganese as breast-fed infants. Calcium deficiency increases the absorption of manganese. A combination of manganese toxicity and calcium deficiency adds up to "reverse Prozac," Masters says.

Masters says toxic metals affect individuals in complex ways. For example, because lead diminishes a person's normal ability to detoxify poisons, lead may heighten the effects of alcohol and drugs.

4) For the neurotoxicity hypothesis to hold up, individuals must receive doses of toxic metals sufficient to be associated with violent behavior. Masters argues that, despite recent significant decreases in lead in the environment (because leaded gasoline and lead paint have been banned in the U.S.), in neighborhoods where automobile traffic has historically been high, and in towns where industries have released large quantities of toxic metals for years, many local soils still contain toxic quantities of lead, cadmium, and manganese sufficient to poison children who play in the dirt. He also argues that aging water delivery systems very likely contribute lead and manganese because lead pipes and even iron pipes contain these toxins.

Masters argues that (a) children absorb up to 50% of the lead they ingest (compared to 8% for adults); (b) even low exposures in the womb and in early childhood can have permanent effects on intelligence and behavior; (c) current lead levels are known to have direct effects on neurotransmitters that are known to affect cognition and to influence impulse control; and (d) the highest levels of lead uptake are reported in precisely the demographic groups most likely to commit violent crimes (inner city minority youths).

Masters emphasizes the importance of studies showing a synergistic effect (multiplier effect) between toxic metals and poor diet. For example, it has been thoroughly documented that uptake of lead is greatly increased among individuals who have a diet low in calcium, zinc, and essential vitamins. Similarly, as noted above, calcium deficiency greatly increases one's absorption of manganese. Thus, Masters argues, amounts of lead and manganese that wouldn't harm a well-nourished individual may poison undernourished children.

Masters cites federal studies of nutrition to make the point that black teenage males consume, on average, only about 65% as much calcium as whites. The calcium needs of pregnant or breast-feeding women are higher than average, which creates a particular problem for minority women. And non-Hispanic black women get only 467 milligrams of calcium per day (mg/d), compared to 642 mg/d for white women, government studies show.

Because of increased manganese absorption by babies who drink infant formula and who are not breast fed, Masters considers infant formula toxic. He emphasizes that poor mothers tend not to breast-feed their babies. By 1986-87, 73 percent of infants born to mothers with more than 12 years of education were breastfed compared with

49 percent of infants born to mothers with 12 years of education, and 31 percent of mothers with less than 12 years of education. Furthermore, white infants are more than three times as likely to be breast fed as black infants. "The effects of manganese toxicity associated with infant formula are thus greatest for the poor, for ethnic minorities, and for those with little education," Masters says.

Masters cites studies showing that alcohol increases the uptake of toxic metals, at least in laboratory animals, and probably has a similar effect on humans.

5) If the neurotoxicity hypothesis is valid, then measures of environmental pollution should correlate with higher rates of violent crime.

To test his hypothesis, Masters acquired data from the FBI for violent crimes in all counties of the U.S. He correlated this with data on industrial releases of lead and manganese into the environment of each county, using data from the U.S. Environmental Protection Agency's TRI [toxic release inventory] database. He also examined other variables for each county -- population size, population density, housing built before 1950, number of police officers per person, number of school dropouts and high school dropouts, educational achievement, unemployment rate, race and ethnicity [white, black, hispanic], persons below the poverty level, number of people on welfare, infant deaths per 1000 live births, all alcohol-related causes of death, and all causes of death with explicit mention of alcohol.

The EPA's recorded releases of toxic metals are not predicted by these demographic or socio-economic variables. In fact, less that 5% of the variance of reported releases of lead is accounted for by 19 socio-economic factors (many of them listed in the previous paragraph).

Masters split all U.S. counties into six groups -- those with and without industrial lead releases; those with and without industrial manganese releases; and those with higher-than-average or lower-than-average rates of alcohol-related deaths. After controlling for all the conventional measures of social deterioration (poverty, school dropouts, etc.), Masters found that counties having all three measures of neurotoxicity -- lead, manganese, and high alcohol -- have rates of violent crime three times the national average.

In other words, environmental pollution and alcohol have a strong effect on violent crimes, completely independent of any of the "traditional" predictors of violent crime (poverty, poor education, etc.)

As Masters says, neurotoxicity is only one of many factors contributing to violence, but he believes it may be especially important in explaining why violent crime rates differ so widely between geographic areas and by ethnic group. Masters says that traditional sociological approaches to crime cannot explain why the availability of handguns or drugs triggers violent behavior in only a small proportion of the population, a proportion that varies greatly from place to place. Part of the explanation may be the way the physical environment affects brain chemistry and behavior, Masters says.

"The presence of pollution is as big a factor as poverty," Masters said recently in an interview in *New Scientist* magazine.[2] "It's the breakdown of the inhibition mechanism that's the key to violent behavior," he says. When our brain chemistry is altered by exposure to toxins, we lose the natural restraint that holds our violent tendencies in check, Masters believes.

Former U.S. Surgeon General C. Everett Koop has said, "Regarding violence in our society as purely a sociologic matter, or one of law enforcement, has led to an unmitigated failure. It is time to test further whether violence can be amenable to medical/public health interventions."[3]

For decades, researchers have focused on the human health consequences of toxic metals -- mainly asking, do they cause cancer? This new research seems to be telling us that we should also be looking at the way these pollutants are affecting human *behavior.*

==========

[1] Roger D. Masters, Brian Hone, and Anil Doshi, "Environmental Pollution, Neurotoxicity, and Criminal Violence," in J. Rose, editor, *Environmental Toxicology* (In press. [London and New York: Gordon and Breach Publishers, 1997]).

The particular crimes are defined as follows:

Murder and nonnegligent manslaughter: the willful (nonnegligent) killing of one human being by another.

Forcible rape: carnal knowledge of a female forcibly and against her will. Assaults or attempts to commit rape by force are also included; however, statutory rape (without force) and other sex offenses are excluded.

Robbery: taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or by threat of force or violence and/or by putting the victim in fear/

Aggravated assault: unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury.

[2] Alison Motluck, "Pollution may lead to a life of crime," *New Scientist* Vol 154, No. 2084 (May 31, 1997), pg. 4.

[3] C.E. Koop and G.D. Lundberg, "Violence in America: A Public Health Emergency," *Journal of the American Medical Association*," Vol. 267, No. 22 (1992), pgs. 3075-3076.

***Rachel's Environment & Health Weekly*** (ISSN 1078-103x) is published weekly by Environmental Research Foundation at 105 Eastern Avenue - Suite 101, Annapolis, MD 21403-3300. Second-Class Postage paid at Annapolis, MD. **POSTMASTER: Send address changes to *RACHEL'S ENVIRONMENT & HEALTH WEEKLY*, P.O. Box 5036, Annapolis, MD 21403-7036.** Peter Montague, editor (National Writers Union, UAW Local 1981/AFL-CIO); Maria B. Pellerano, associate editor; Todd Fiedorowicz, circulation manager. RATES: $25 per year for individuals and citizen groups; $45 for universities and libraries; $80 for professionals and government agencies; $15 for students and seniors; $400 for businesses; in Canada and Mexico, add $8.00; in all other countries, add $15.00. All payments in U.S. funds drawn on U.S. banks. Visa & Mastercard accepted. Telephone (410) 263-1584; fax: (410) 263-8944; E-mail: erf@rachel.clark.net. *Rachel's Environment & Health Weekly* is not copyrighted. Printed on kenaf paper (100% acid-free, chlorine-free, and tree-free).

*Rachel's Environment & Health Weekly*
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Rachel's Environment & Health Weekly #560

Providing news and resources for environmental justice -- August 21, 1997

## Part 1:
## A NEW U.S. WASTE STRATEGY EMERGES

A new strategy for disposal of hazardous materials is emerging in the U.S. After years of unsuccessful efforts to gain public acceptance of waste disposal in the oceans, in landfills, and in incinerators, frustrated environmental officials at the federal and state levels now advocate spreading hazardous materials onto and into the land, essentially dispersing dangerous toxins into the environment, leaving no fingerprints.

Typical projects include these:

• For several years, New Jersey Department of Environmental Protection (DEP) has been using monies earmarked for "recycling" to run experiments placing toxic incinerator ash in road beds. In June of 1996, the research entered the real world when toxic ash from the Warren County, N.J., municipal trash incinerator was mixed with asphalt and spread onto the streets of Elizabeth, N.J., a major city. The "ash recycling" operation took place in the dead of night, but local activists managed to videotape it.[1] New Jersey DEP officials defended the operation, saying it was completely safe and exempt from all state and federal waste management laws because it was termed "recycling."[2]

• The phosphate fertilizer industry is lobbying U.S. Environmental Protection Agency (EPA) for permission to spread radioactively-contaminated phosphogypsum onto roadbeds, or to use it as a fertilizer. Phosphogypsum is a waste product of phosphate mining, principally in Florida. By the year 2000, some 870 million cubic meters (30.7 billion cubic feet) of radioactive phosphogypsum waste will be piled up, awaiting disposition. Phosphogypsum contains 30 picoCuries of radium per gram. Radium has a half-life of 1600 years. The phosphate fertilizer industry proposes to hide this radioactive material beneath roadways. The amount of phosphogypsum available in the year 2000 would require 1.3 million kilometers (807,000 miles) of highway -- about one-fifth of all the roadways under state and federal control in the U.S.[3] Radioactive waste consultant Marvin Resnikoff says such a program would be a "major public health disaster" because it could cause thousands of cancers among unsuspecting citizens.

• U.S. EPA is actively promoting the "beneficial use" of sewage sludge contaminated with industrial toxins. "Beneficial use" includes ploughing contaminated sludge into soil as fertilizer for crops intended for animal feed and for human food. Many such projects are under way across the country, to the dismay of local citizens concerned about the accumulation of toxic materials in the nation's agricultural soils.

In 1990, EPA wrote, "The Agency will continue to enthusiastically promote and encourage the recovery and reuse of sludge wherever its safe environmental use is possible."[4,pgs.47254-47255] To assure the public that almost any sewage sludge poured on crops is "safe," EPA has made exceptionally creative use of risk assessment.

Sewage sludge is the mud-like material that remains after bacteria have digested the human wastes that flow from your toilet into your local sewage treatment plant. If human wastes were the only thing entering the sewage treatment plant, then sewage sludge would contain only nutrients and should undoubtedly be returned to the land.

Unfortunately, most sewage treatment plants receive industrial toxic wastes, which are then mixed with the human wastes, creating a pernicious mixture of nutrients and industrial poisons. Furthermore, many American cities have sewage systems that mix storm water runoff with the regular sewage; every time a rain storm scours these cities' streets, additional toxins are added to the sewage sludge.

U.S. industry currently uses roughly 70,000 different chemicals. Any of these may be found in sewage sludge, depending upon what chemicals local industries and households are using. In 1988, EPA sampled sludge from 180 sewage treatment plants, but they only looked for 409 chemicals, without sampling for the roughly 69,600 others that they might have looked for. The "detection limits" for many organic chemicals were set so high that few were detected even though many were doubtless present.[5] Of the original 409, EPA narrowed the list to only 28, which were labeled "of concern," ignoring the other 381. From that list of 28, EPA then picked 10 metals that they would regulate: arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.

Sewage sludge regulations -- known as the Clean Water Act Part 503 regulations -- were published in the *Federal Register* February 19, 1993.[6]

The regulations were based on a "comprehensive"[4,pg.47252] risk assessment of a "highly exposed individual."[4,pg.47249] In other words, EPA asked how much of each of the 10 pollutants a highly-exposed individual would be exposed to in various scenarios. If their risk assessment showed that this individual would not be harmed by a particular level of pollutants, EPA declared that level safe.

There are several serious flaws in such a procedure. First, no risk assessment is ever "comprehensive" (especially not one based on only 10 out of 70,000 possible chemicals) and to label it such is misleading. Tomorrow's science will very likely prove today's science wrong, so no risk assessment is ever "comprehensive." Secondly, EPA assumed that the "highly exposed individual" did not have any other exposures to toxins besides the exposures created by the sewage sludge. Clearly, this is a false assumption because each of us is exposed to tobacco smoke, automobile exhaust, pharmaceutical preparations, pesticides, and a host of other pollutants in our daily air, water, and food.

Third, and most importantly, concern for the "highly exposed individual" omits the major category of dangers inherent in "beneficial use" of sewage sludge: the slow but steady buildup of toxins in soils and in food-chains that begin in the soils (such as earthworms or insects to birds).[7] As Robert Goodland of the World Bank and waste consultant Abby Rockefeller have recently written,

"Land application [of sludge] was implemented in Sweden in the early 1980s with disastrous results, which to date the U.S. EPA seems to be ignoring. Such a practice must lead to accumulation in living tissues of heavy metals and persistent organic chemicals: first they accumulate in the soil, then in decomposer microbes and soil-conditioning invertebrates. Other life forms are damaged as thousands of non-biocompatible substances move up the food chain. The toxic effect on crops, as well as on the consumers of such crops, is buying risks for the future."[8] It has been shown, for example, that sewage sludge applied to soils can increase the dioxin intake of humans eating beef (or cow's milk) produced from those soils.[9]

The fundamental problem with sewage sludge is that its four main categories of potential pollutants -- nutrients, pathogens, toxic organics, and heavy metals -- behave differently and cannot all be managed by any single kind of treatment.[8] The goal of "safe management" of such a complex toxic mixture simply cannot be met at any reasonable cost. Ploughing it into cropland doesn't change that fact.

• In Pennsylvania, state environmental officials are promoting the "beneficial use" of coal ash and incinerator ash as a soil amendment, to rehabilitate coal mines and strip-mined lands.[10] A private firm, Beneficial Ash Management, in Morrisdale, Pa., reportedly supplies the ash, which it gets from "power plants, mid-sized industries, and paper manufacturers." Professor Barry Sheetz of Pennsylvania State University, funded by U.S. EPA, is providing the engineering know-how to harden the toxic ash into a cement-like material, which is then placed in mines and onto strip-mined land. The cement-like material is then covered with "synthetic soil" and left. Professor Sheetz says he hopes this provides a permanent solution to the problem of acid mine drainage. More likely, it promises to provide a cheap, permanent solution for toxic wastes generated by coal-burning power plants and incinerators as far flung as the American Ref-Fuel incinerator in Essex County, N.J.; International Paper Company's plants in Erie, and Lock Haven, Pa.; and the Tobyhanna (Pa.) Army Depot, saving each of these facilities large sums of money that would otherwise be spent on toxic waste disposal, and absolving them of liability because their wastes will never again be identifiable or traceable.

• In Washington state, the *Seattle Times* recently published a series titled "Fear in the Fields," which documented the disposal, nationwide, of industrial wastes on farmers' fields as "fertilizer." The *Times* reported, "Manufacturing industries are disposing of hazardous wastes by turning them into fertilizer to spread around farms. And they're doing it legally...."

The *Times* gave this typical example:

"A dark powder from two Oregon steel mills is poured from rail cars into the top of silos attached to Bay Zinc Co. under a federal permit to store hazardous waste.

"The powder, a toxic by-product of the steel making process is taken out of the bottom of the silos as a raw material for fertilizer.

"'When it goes into our silo, it's a hazardous waste,' said Bay Zinc President Dick Camp. 'When it comes out of the silo, it's no longer regulated. The exact same material. Don't ask me why. That's the wisdom of the EPA.'"[11]

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[1] Sandy Lovell, "Environmentalists fume as incinerator ash pavers strike in the dead of night," *Newark Star-Ledger* June 21, 1996, pg. 39.

[2] Maryann Spoto, "Judge delays ruling on paving Elizabeth roads with incinerator ash," *Newark Star-Ledger* June 15, 1996, pg. 13.

[3] Garry Lenton, "Runoff from old coal mines pollutes state's streams; 2 PSU [Pennsylvania State University] Professors create remedy to help separate rainwater, shafts," *Harrisburg Patriot* April 21, 1997, pg. A3.

[4] Environmental Protection Agency, "40 CFR Part 503; National Sewage Sludge Survey; Availability of Information and Data, and Anticipated Impacts on Proposed Regulations; Proposed Rule," *Federal Register* November 9, 1990, pgs. 47210-47283.

[5] R.D. Kuchenrither and S.I. McMillan, "Preview Analysis of National Sludge Survey," *BioCycle* (July 1990), pgs. 60-62.

[6] The "Part 503" sewage sludge regulations are available on diskette from the National Technical Information Service [NTIS]; telephone 1-800-553-6847; purchase item No. PB93-500478INC; price: $60.00.

[7] See, for example, J.G. Babish and others, *Organic Toxicants and Pathogens in Sewage Sludge and Their Environmental Effects* [Special Report No. 42] (Ithaca, N.Y.: Cornell University, 1981). And see Thomas S. Davis and others, "Uptake of Polychlorobiphenyls Present in Trace Amounts from Dried Municipal Sewage Sludge Through an Old Field Ecosystem," *Bulletin of Environmental Contamination and Toxicology* Vol. 27 (1981), pgs. 689-694.

[8] Robert Goodland and Abby Rockefeller, "What is Environmental Sustainability in Sanitation?" *IETC's Insight* [newsletter of the United Nations Environment Programme, International Environmental Technology Centre] Summer, 1996), pgs. 5-8. The International Environmental Technology Centre can be reached at: UNEP-IETC, 2-1110 Ryokuchikoen, Tsurumi-ku, Osaka 538, Japan. Telephone: (81-6) 915-4580; fax: (81-6) 915-0304; E-mail: cstrohma@unep.or.jp; URL: http://www.unep.or.jp/.

[9] Simon R. Wild and others, "The Influence of Sewage Sludge Applications to Agricultural Land on Human Exposure to Polychlorinated Dibenzo-*p*-dioxins (PCDDs) and -Furans (PCDFs)," *Environmental Pollution* Vol. 83 (1994), pgs. 357-369. And see: Michael S. McLachlan and others, "A Study of the Influence of Sewage Sludge Fertilization on the Concentrations of PCDD/F and PCB in Soil and Milk," *Environmental Pollution* Vol. 85 (1994), pgs. 337-343.

[10] Personal communication with Marvin Resnikoff, Radioactive Waste Management Associates, New York, New York; phone: (212) 260-0526.

[11] Duff Wilson, "Fear in the fields; how hazardous waste becomes fertilizer," *Seattle Times* July 3, 1997, pgs. A1, A10.

*Rachel's Environment & Health Weekly* (ISSN 1078-103x) is published weekly by Environmental Research Foundation at 105 Eastern Avenue - Suite 101, Annapolis, MD 21403-3300. Second-Class Postage paid at Annapolis, MD. **POSTMASTER: Send address changes to *RACHEL'S ENVIRONMENT & HEALTH WEEKLY*, P.O. Box 5036, Annapolis, MD 21403-7036.** Peter Montague, editor (National Writers Union, UAW Local 1981/AFL-CIO); Maria B. Pellerano, associate editor; Todd Fiedorowicz, circulation manager. RATES: $25 per year for individuals and citizen groups; $45 for universities and libraries; $80 for professionals and government agencies; $15 for students and seniors; $400 for businesses; in Canada and Mexico, add $8.00; in all other countries, add $15.00. All payments in U.S. funds drawn on U.S. banks. Visa & Mastercard accepted. Telephone (410) 263-1584; fax: (410) 263-8944; E-mail: erf@rachel.clark.net. *Rachel's Environment & Health Weekly* is not copyrighted. Printed on kenaf paper (100% acid-free, chlorine-free, and tree-free).

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Rachel's Environment & Health Weekly #561

Providing news and resources for environmental justice – August 28, 1997

## Sewage Sludge
## A NEW U.S. WASTE POLICY EMERGES, Pt. 2

In the mid-1980s, a citizens' organization in New Jersey -- Clean Ocean Action, led by Cindy Zipf -- launched an aggressive campaign to protect the oceans from the dumping of toxic sewage sludge. They were up against extraordinary power: U.S. Environmental Protection Agency (EPA) opposed them; New York and New Jersey environmental officials opposed them; nearly every municipal government opposed them. But they persevered and won.

Thus in the early 1990s, municipalities had to find other places to dump their sewage sludge.

As we saw last week, sewage sludge is the mud-like material that remains after bacteria have digested the human wastes that flow from your toilet into your local sewage treatment plant. If human wastes were the only substances entering the sewage treatment plant, then sewage sludge would contain only nutrients and should be returned to the land.

Unfortunately, most sewage treatment plants receive industrial toxic wastes, which are then mixed with the human wastes, creating a poorly-understood mixture of nutrients and industrial poisons. Furthermore, many American cities have built sewage systems that mix storm water runoff with the regular sewage; every time a rain storm scours these cities' streets, additional toxins are added to the sewage sludge.

As a result, sewage sludge contains a strange brew of nutrients laced with low levels of PCBs [polychlorinated biphenyls]; dioxins and furans; chlorinated pesticides [such as DDT, DDD, DDE, dieldrin, aldrin, endrin, chlordane, heptachlor, lindane, mirex, kepone, 2,4,5-T, and 2,4-D]; carcinogenic polynuclear aromatic hydrocarbons [PAHs]; heavy metals [arsenic, mercury, lead, selenium, cadmium, etc.]; bacteria, viruses, parasitic worms, and fungi;[1] industrial solvents; asbestos; petroleum products, and on and on. American industry uses roughly 70,000 different chemicals and any of these can be found in sewage sludge -- depending on who's pouring what down the drain at any given time and place. In addition to the original chemicals, unique metabolites and degradation products develop anew in sludge. To give but one example: trimethylamine can be converted to the powerful carcinogen, dimethylnitrosamine.[2]

The U.S. produces 5.3 million metric tonnes (11.6 billion pounds) of sewage sludge each year (that's dry weight, not including the weight of the water that carries it). Today about 16% of U.S. sewage sludge is incinerated and the ashes are buried in landfills; 38% of sludge is landfilled directly; 36% is spread onto farmland or forest land or otherwise mixed into soils; and 10% is handled in other ways (piled on the land and abandoned, for example).[3]

The sewage treatment industry -- and the municipal governments that employ them -- represent a powerful political force in the U.S. Together in the late 1980s they figured out that the cheapest thing to do with sewage sludge is to spread it onto or into the land, preferably as close to its point of origin as possible, to minimize transport costs.

However, there were obstacles to overcome. The public thinks of sewage sludge as dirty, smelly and dangerous. Few people thought sewage sludge sounded good as fertilizer for food. So the industry hired a public relations firm, Powell Tate, and renamed sewage sludge "biosolids." They convinced U.S. Environmental Protection Agency (EPA) to go along with this verbal detoxification. The Federation of Sewage Works Associations also renamed itself -- they are now the Water Environment Federation (WEF).[4]

The scientific literature on sewage sludge is large, but much of it consists of articles intended to break down public resistance to the use of sewage sludge on farm land. It is "happy literature," not necessarily honest literature. Nevertheless, there is a core of serious research that has tried to discover what the consequences might be if farmers adopted sewage sludge as fertilizer. In recent months, we have examined this literature, and here is what we found:

• Sewage sludge is mutagenic (it causes inheritable genetic changes in organisms),[5,6] but no one seems sure what this means for human or animal health. In its regulations for sewage sludge, EPA has simply ignored this information.[7,8]

• Two-thirds of sewage sludge contains asbestos. Because sludge is often applied to the land dry, asbestos may be a real health danger to farmers, neighbors and their children.[9,10,11] In its sludge regulations, EPA does not mention asbestos.[7,8]

• EPA issued numeric standards for 10 metals (arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc).[8] However, the movement of metals from soils into groundwater, surface water, plants, and wildlife -- and of the hundreds of other toxins in sludge, which EPA chose not to regulate -- are poorly understood.[12] Their movement depends upon at least the following factors: plant species, soil type, soil moisture, soil acidity or alkalinity, sludge application rate, slope, drainage, and the specific chemistry of the toxins and of the sludge itself.[13,14]

• Soil acidity seems to be the key factor in promoting or retarding the movement of toxic metals into groundwater, wildlife, and crops.[15,16] In creating its regulations, EPA assumed that sludge-treated land would be under the perpetual care of a farmer who would lime the soil to keep it alkaline and prevent the metals from moving dangerously. For this reason, a buildup of toxic heavy metals in soils is often dismissed as irrelevant. But in the real world, farmers go out of business while acid precipitation keeps soaking soils with dilute acid year after year. A buildup of toxic heavy metals in soil today[17] seems to be a prescription for trouble 30 to 50 years down the road.[18]

The National Research Council (NRC) of the National Academy of Sciences gives sewage sludge treatment of soils a clean bill of health in the short term, "as long as... acidic soils are agronomically managed." However the NRC acknowledges that toxic heavy metals and persistent organic pollutants can build up in treated soils: "Potentially harmful trace elements and certain persistent organic chemicals in raw municipal wastewater become concentrated in the sludge during the treatment process, and, with repeated applications of sludge to the land, these chemicals may accumulate in the soil," says the NRC.[3] If such a buildup occurs and the soils are no longer "agronomically managed" but are left alone to be washed by acid rain in perpetuity, what will happen then?

• Research clearly shows that, under some conditions (which are not fully understood), toxic metals and organic industrial poisons can be transferred from sludge-treated soils into crops.[19] Lettuce, spinach, cabbage, Swiss chard,

and carrots have all been shown to accumulate toxic metals and/or toxic chlorinated hydrocarbons when grown on soils treated with sewage sludge.[20,21,22,23,24]

• In some instances, toxic organics contaminate the leafy parts of plants by simply volatilizing out of the sludge.[2]

• There is good reason to believe that livestock grazing on plants treated with sewage sludge will ingest the pollutants -- either through the grazed plants, or by eating sewage sludge along with the plants. Sheep eating cabbage grown on sludge developed lesions of the liver and thyroid gland. Pigs grown on corn treated with sludge had elevated levels of cadmium in their tissues.[25] Cows, goats, and sheep are also likely to eat sludge directly. In grazing, these animals may pull up plants by the roots and thus ingest substantial quantities of soil. A cow may ingest as much as 500 kg (1100 pounds) of soil each year.[26]

• Small mammals have been shown to accumulate heavy metals after sewage sludge was applied to forest lands. Shrews, shrew-moles, and deer mice absorbed metals from sludge.[27] Insects in the soil absorb toxins, which then accumulate in birds.[28]

• It has been shown that sewage sludge applied to soils can increase the dioxin intake of humans eating beef (or cow's milk) produced from those soils.[29,30] Humans in the industrial world already carry unsafe burdens of dioxin in their bodies, according to EPA. (See *REHW #390, #391,* and *#414.*) From a public health perspective, any unnecessary addition of dioxin to human food chains is unthinkable and unacceptable.

• Sewage sludge is produced in the huge quantities day after day, year after year. Sludge never takes a holiday. Municipalities find themselves under relentless pressure to get rid of the stuff, day after day after day. It is exceedingly expensive to treat it to clean it up. Towns and cities have every inducement to cut corners, skimp on tests, fudge the numbers, claim that their sludge is cleaner than it really is. Farmers have no capacity to analyze sludge independently; they must rely on the word of the sludge supplier. Only an aggressive, independent oversight agency can protect public health. Where can such an agency be found? Who has confidence that their state government, or U.S. EPA, will play that role?

EPA has acknowledged that it hasn't adequate funding to oversee the nation's sewage sludge management program.[31,32] "At headquarters, staff has been cut dramatically over the last year, and we can only do so much," one EPA official told *BioCycle* magazine.[31] And a Washington state official said, "...with EPA cutting back from financing the sludge program, the problem will be whether state or local officials have the resources to adequately oversee every [sludge] application site."[3]

Who, then, will protect public health from the purveyors of toxic sludge? Who will protect the nation's agricultural soils from contamination, providing food security for future generations?

And, finally, who will lead the transition to a truly sustainable way of managing human waste?[33]

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[33] Robert Goodland and Abby Rockefeller, "What is Environmental Sustainability in Sanitation?" *IETC's Insight* [newsletter of the United Nations Environment Programme, International Environmental Technology Centre] Summer, 1996), pgs. 5-8. The International Environmental Technology Centre can be reached at: UNEP-IETC, 2-1110 Ryokuchikoen, Tsurumi-ku, Osaka 538, Japan. Telephone: (81-6) 915-4580; fax: (81-6) 915-0304; E-mail: estrohm@unep.or.jp; URL: http://www.unep.or.jp/.

***Rachel's Environment & Health Weekly*** (ISSN 1078-103x) is published weekly by Environmental Research Foundation at 105 Eastern Avenue - Suite 101, Annapolis, MD 21403-3300. Second-Class Postage paid at Annapolis, MD. **POSTMASTER: Send address changes to *RACHEL'S ENVIRONMENT & HEALTH WEEKLY*, P.O. Box 5036, Annapolis, MD 21403-7036.** Peter Montague, editor (National Writers Union, UAW Local 1981/AFL-CIO); Maria B. Pellerano, associate editor; Todd Fiedorowicz, circulation manager. RATES: $25 per year for individuals and citizen groups; $45 for universities and libraries; $80 for professionals and government agencies; $15 for students and seniors; $400 for businesses; in Canada and Mexico, add $8.00; in all other countries, add $15.00. All payments in U.S. funds drawn on U.S. banks. Visa & Mastercard accepted. Telephone (410) 263-1584; fax: (410) 263-8944; E-mail: erf@rachel.clark.net. *Rachel's Environment & Health Weekly* is not copyrighted. Printed on kenaf paper (100% acid-free, chlorine-free, and tree-free).

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**SECOND CLASS**

TO:

Rachel's Environment & Health Weekly #562

Providing news and resources for environmental justice – September 4, 1997

## THE CAUSES OF LYMPH CANCERS

Non-Hodgkin's lymphoma (NHL) is a group of cancers that arise in the white blood cells. NHL is increasing rapidly in the U.S. and elsewhere in the industrialized world. In the year 1950, 5.9 Americans per 100,000 were diagnosed with non-Hodgkin's lymphoma. In 1985, the incidence (occurrence) rate of this disease had risen to 13.1 per 100,000.[1] By 1991, the incidence rate had reached 15.1 per 100,000 and was still climbing.[2]

Between 1973 and 1991, the incidence of non-Hodgkin's lymphoma increased at the rate of 3.3% per year, making it the third fastest-growing cancer (after prostate cancer, growing at 3.9% per year, and melanoma of the skin, also growing at 3.9% per year).[2] In recent years, AIDS patients have contributed to the increase in NHL, but a steady rise in the incidence of this disease was apparent long before the AIDS epidemic. Together the known "risk factors" for NHL -- including immune-suppressing drugs, rare immune-system diseases, and AIDS, explain only a small proportion of NHL cases.

About 50,900 new cases of NHL were diagnosed in the U.S. in 1995 and about 22,700 deaths from NHL were reported that year.[3] NHL is a serious disease; half the people diagnosed with it are dead within five years. The causes of NHL are not understood, but the following factors have been implicated in many studies:

• Phenoxy herbicides, especially 2,4,5-T (the herbicide now banned in the U.S.) and 2,4-D the most popular chemical killer of dandelions and crabgrass in lawns.[4] More than a dozen studies now indicate that exposure to these herbicides increases the likelihood of getting NHL.

• Viruses. The roles of viruses "appears to be minor," say Paul Scherr and Nancy Mueller, who are experts in the viral causes of cancer. However, the Epstein Barr virus (EBV) seems to be implicated in some way in many cases of non-Hodgkin's lymphoma, although the virus *by itself* does not seem to cause the disease.[1,5]

• People with compromised immune systems and/or autoimmune diseases have a substantially increased likelihood of getting NHL. This is a consistent thread running throughout NHL research: the NHL family of cancers tends to strike people whose immune systems are degraded for one reason or another. This was first discovered among people who had had organ transplants. The body's immune system naturally tries to reject foreign organs. To allow a foreign kidney or liver to be accepted, doctors devised medications to suppress the immune system. In some instances, suppressing the immune system gave rise to NHL. Since that time, researchers have documented many different ways in which suppressed or malfunctioning immune systems allow NHL to develop.

In the authoritative reference book, *Cancer Epidemiology and Prevention*, Paul Scherr and Linda Mueller conclude[1] that there are two clear threads visible in NHL research:

1. People whose immune systems are continually challenged (for example, by medications or by autoimmune diseases such as rheumatoid arthritis, or by other factors) seem to lose control of latent cancer-causing infections that may be caused by viruses such as the Epstein Barr virus.

2. "Another group who appears to be at increased risk are individuals with occupational exposures to chemicals," say Scherr and Mueller. They continue, "There is mounting evidence implicating phenoxy herbicide exposures, although the evidence is still not conclusive."[1]

Scherr and Mueller do not say so, but there is also evidence that the likelihood of NHL is increased by exposure to DDT, the well-known organochlorine pesticide.[6] In addition, recent evidence suggests that another class of pesticides -- the organophosphates such as malathion and parathion -- can cause NHL.[7] Thus organochlorines, organophosphates, and phenoxy herbicides are now all implicated in the mushrooming problem of NHL.

Most recently, provocative new research indicates that PCBs, too, can cause non-Hodgkin's lymphoma. From 1929 until just recently, PCBs were used in electrical equipment as fire retardants. They were also used in plastics, preservatives, varnishes, waxes, and carbonless carbon paper.

The connection between PCBs and NHL was first suggested in 1996 by the Swedish researcher, Lennart Hardell.[8] Hardell studied a small group (28 individuals) with NHL and compared them to a control group of 17 surgical patients in the same Swedish hospital who did not have cancer. Hardell took tissue samples from both groups and analyzed them for DDT and its breakdown product, DDE; dioxins; hexachlorobenzene (HCB); and PCBs. The tissue concentrations of both groups were the same for DDT, DDE, HCB and dioxins. However, when it came to PCBs, the group with NHL has significantly[9] more PCBs in their tissues than the control group did.

This finding is biologically plausible because PCBs are known to suppress the immune system of animals and humans. Hardell concluded his research report in 1996 saying, "Immunological impairments have been shown after exposure to PCBs. Since immunosuppression is an established risk factor for NHL, our results are of interest in the etiology [causation] of NHL but need to be confirmed in larger studies."

Now a larger study by the National Cancer Institute (NCI) has confirmed Hardell's results.[10] NCI researchers set out to explore whether people with NHL had more than their fair share of DDT in their tissues. They examined blood that had been taken from nearly 26,000 healthy individuals in 1974 -- a study known as the Campaign Against Cancer and Stroke [or CLUE I] being conducted at Johns Hopkins University in Baltimore. Within the large group, they identified 74 individuals who had eventually contracted NHL, and they matched them against 147 controls who did not have NHL.

The NCI researchers did not find any connection between DDT and NHL but, quite unexpectedly, they found a 4.5-fold increase in non-Hodgkin's lymphomas among people who had 1050 parts per billion (ppb) of PCBs in the fat globules of their blood, compared to people who had only 250 to 650 ppb PCBs. The study found a clear dose-response relationship between PCBs in the blood and the likelihood of having NHL.

Furthermore, this NCI study provided additional

evidence of the role of the Epstein Barr virus in NHL. Individually, PCBs and EBV each increased the likelihood of NHL. However, together, the presence of *both* Epstein Barr virus *and* elevated PCBs in individuals had a synergistic effect, combining to produce a 22-fold increase in the likelihood of NHL.

The solution to this problem has two parts. One part involves the use of pesticides. Organochlorines, organophosphates, and phenoxy herbicides all increase the dangers of NHL. In the case of these chemicals, it is not too late to make sensible, precautionary decisions. In our homes, our public buildings, our schools, and our businesses we could avoid these products like the plague. Alternative ways of dealing with pests are well-known. If pesticides are needed at all, they are needed only in emergencies.

The second part of the problem is PCBs. Some 3.4 billion pounds of PCBs were distributed into the environment -- all of them manufactured or licensed for manufacture by one corporation, Monsanto of St. Louis, Missouri.[11]

The whereabouts of 30 percent of all PCBs (roughly a billion pounds) remains unknown. Another 30 percent resides in landfills, in storage, or in the sediments of lakes, rivers, and estuaries. Some 30 percent to 60 percent remains in use. The characteristics of PCBs (their stability and their solubility in fat) tend to move them into the oceans as time passes. There they decimate wildlife. It is estimated that only one percent of all PCBs have, so far, reached the oceans.

Without major efforts to locate, capture, and destroy the one-to-two billion pounds of PCBs that are "out there," future generations will continue to be poisoned by PCBs, at great social and individual cost.

Recently, we hear a drum beat of public relations from Monsanto, claiming that it has turned over a new leaf and is now committed to behaving in a civilized fashion. If this is so, Monsanto could demonstrate its awakening by leading a global effort to locate and destroy PCBs, cleansing the planet (to the extent possible) of this brain-damaging, immune-suppressing, cancer-causing substance. Has anyone seen a sign of serious intentions from St. Louis?

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[10] Nathaniel Rothman and others, "A nested case-control study of non-Hodgkin lymphoma and serum organochlorine residues," *The Lancet* Vol. 350 (July 26, 1997), pgs. 240-244.

[11] Carol W. Bason and Theo Colborn, "U.S. Application and Distribution of Pesticides and Industrial Chemicals Capable of Disrupting Endocrine and Immune Systems," in Theo Colborn and Coralie Clement, editors, *Chemically-Induced Alterations in Sexual and Functional Development: The Wildlife/Human Connection* [Advances in Modern Environmental Toxicology Vol. XXI] (Princeton, N.J.: Princeton Scientific Publishing Co., 1992), pgs. 335-345.

## 4th NATIONAL GRASS-ROOTS CONVENTION OCTOBER 3-5

The CCHW Center for Health, Environment and Justice will sponsor its fourth national grass-roots convention October 3-5 in Arlington, Va., just outside Washington, D.C.

CCHW conventions provide grass-roots activists a chance to celebrate victories, create and renew friendships, develop strategies and learn specific skills for use in local fights. This convention will be an exceptionally good one.

The agenda includes numerous practical workshops on a broad range of subjects like "advanced organizing" and SLAPP suits and how to do research.

In addition, there will be thought-provoking sessions on big-picture topics, such as: sustainable economic development; coalition building; expanding and diversifying the grass-roots movement; "It's the economy, stupid;" and challenging corporate control of our society.

Personally, I wouldn't miss this convention for anything. --Peter Montague

For more details, contact CCHW: P.O. Box 6806, Falls Church, VA 22040; telephone (703) 237-2249.

*Rachel's Environment & Health Weekly* (ISSN 1078-103x) is published weekly by Environmental Research Foundation at 105 Eastern Avenue - Suite 101, Annapolis, MD 21403-3300. Second-Class Postage paid at Annapolis, MD. **POSTMASTER: Send address changes to *RACHEL'S ENVIRONMENT & HEALTH WEEKLY*, P.O. Box 5036, Annapolis, MD 21403-7036.** Peter Montague, editor (National Writers Union, UAW Local 1981/AFL-CIO); Maria B. Pellerano, associate editor; Todd Fiedorowicz, circulation manager. RATES: $25 per year for individuals and citizen groups; $45 for universities and libraries; $80 for professionals and government agencies; $15 for students and seniors; $400 for businesses; in Canada and Mexico, add $8.00; in all other countries, add $15.00. All payments in U.S. funds drawn on U.S. banks. Visa & Mastercard accepted. Telephone (410) 263-1584; fax: (410) 263-8944; E-mail: erf@rachel.clark.net. *Rachel's Environment & Health Weekly* is not copyrighted. Printed on kenaf paper (100% acid-free, chlorine-free, and tree-free).

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Rachel's **Environment & Health Weekly #636**

*Providing news and resources for environmental justice -- February 4, 1998*

## DIOXINS -- THE VIEW FROM EUROPE

The term "dioxin" encompasses a family of 219 different toxic chemicals, all with similar characteristics but different potencies.[1] In recent years, the International Agency for Research on Cancer (IARC), a division of the World Health Organization, has labeled the most potent dioxin, called TCDD, a known human carcinogen.[2] IARC has labeled many of the less potent dioxins "probable" human carcinogens.

Low-level exposures to dioxins are also known to interfere with the immune system, the reproductive system, the endocrine system, and the early growth and development of humans and animals.[3] In sum, dioxins are a family of powerful all-purpose poisons.

In the early 1990s, many governments, including the U.S. government, reported that everyone in the industrialized world is exposed to substantial quantities of dioxins day in and day out, thus acknowledging a humiliating failure of the world's public health apparatus.

In 1991, the U.S. EPA [Environmental Protection Agency] with considerable fanfare announced it was undertaking a full-blown scientific re-assessment of dioxin. Nine years later, that re-assessment has now disappeared from view and may have died, a victim of politics. (See *REHW #390, #391.*) The big corporate dioxin dischargers are also major contributors to federal election campaigns, and the Clinton/Gore administration at this point in history seems incapable of even gumming the hand that feeds it. Furthermore, since 1994, the Republican-dominated Congress has dropped all pretense of acting independently of its corporate sponsors.

Meanwhile, a meeting of 40 scientists convened in Switzerland last May by the World Health Organization concluded that dioxin is 2 to 10 times as toxic as it had seemed in 1990,[3] and a group of German scientists concluded last April that dioxin may be responsible for 12% of human cancers in industrialized countries.[4] If this estimate were correct, it would mean dioxin is responsible for 120,000 cancers each year in the U.S. This new German estimate is at least 10 times as high as previous estimates by U.S. government scientists (see *REHW #390, #391*).

The good news is that the levels of dioxin in the environment have dropped as much as 50% in the last decade as governments in Europe and local activists in this country have forced industry to adopt cleaner technologies.[3] Still, many of the effects of dioxins are delayed by a decade or more, so health effects from past exposures will continue to manifest themselves for several decades.

Except as laboratory curiosities, dioxins are never intentionally produced because they have no commercial value. However, they are created as unwanted byproducts by most combustion processes; during the manufacture of many kinds of chemicals, pesticides and wood preservatives; during incineration of medical, municipal and hazardous wastes; in metal smelting; and in the manufacture of paper. An important pathway for spreading dioxins into the environment is using sewage sludge as a soil amendment or a fertilizer.

Dioxins are also present in cigarette smoke at about the same concentration found in the stack of a municipal incinerator, the difference being that no one draws the smoke from an incinerator into their lungs undiluted, or exhales incinerator flue gas into an enclosed room for others to breathe.[5]

Some dioxins are more toxic than others, and the scientific community has established a way of comparing the toxicities and the quantities of various mixtures of dioxins. The technique is called TEQ, or toxic equivalents. The TEQ system takes into account the variations in toxicity and expresses toxicity in terms of the most toxic dioxin, which is TCDD.

For example, U.S. EPA estimates that total dioxin emissions in the U.S. averaged about 3000 grams (3 kilograms, or 6.6 pounds) per year TEQ in 1995. This means that all of the dioxins released into the environment in 1995 in the U.S. had a total toxicity equal to the toxicity of 3000 grams of TCDD.[6] (EPA acknowledges considerable uncertainty in this estimate; the true average lies somewhere between 1200 grams and 7900 grams TEQ, EPA says.[6-pg.2-7])

According to EPA, the major sources of dioxins in 1995 were municipal garbage incinerators (1100 grams, 36% of the national total); medical waste incinerators (477 grams, 16%); cement kilns burning hazardous waste (153 grams, 5%); industrial coal combustion (73 grams, 2.4%); residential wood combustion (63 grams, 2%); industrial wood combustion (29 grams, 1%); diesel engines (33 grams, 1%); copper smelting (504 grams, 17%); aluminum smelting (17 grams, 0.5%); forest fires (208 grams, 7%); incineration of sewage sludge (6 grams, 0.2%); plus 375 grams (12% of the national total) spread directly into the nation's soils in sewage sludge.[6-pg.2-13] (The total is not exactly 100% because of rounding.)

Dioxins do not dissolve readily in water, but they do in fat. Therefore, fat-containing foods tend to be contaminated with dioxins. Adults in the U.S. take in between one and 10 picograms of dioxin TEQ per kilogram of body weight per person per day (pg/kg/day).[1,3] (A kilogram is 1000 grams, or 2.2 pounds; a picogram is a trillionth of a gram and there are 28 grams in an ounce.) Eighty to 90 percent of our daily dioxin intake comes from eating milk, meat and fish.

Breast-fed infants take in 70 picograms of dioxin TEQ per kilogram of body weight per day -- seven to 70 times as much as the average adult.[3] Despite this, breast-fed infants are healthier than infants fed bottled formula.

The cancer hazard from routine exposure to dioxin has recently been estimated by a group of German scientists.[4] They report that, for adults, the lifetime cancer hazard lies somewhere between one per hundred and one per thousand for each picogram of dioxin TEQ ingested per kilogram of body weight per day (pg/kg/day). Since the daily ingestion in the U.S. ranges from one to 10 pg/kg/day, we can calculate that the cancer hazard from environmental exposure to dioxin ranges between one per thousand and 100 per thousand. The middle of this range would be 50 per thousand. Because the average person's lifetime chance of getting cancer is now about 400 per thousand (or four in 10), we can see that routine exposure to environmental dioxins may be making a substantial (12%) contribution to

the danger of cancer in this country, if the German estimate holds true. If it holds true, it qualifies as a public health disaster.

The mechanisms by which dioxin causes cancer remain poorly understood. In most studies, dioxin seems to be a powerful promoter of cancer, rather than an initiator. In other words, once a cell has been made cancer-prone by something else, dioxin may push it over the edge and turn it into a full-blown cancer. This would explain why dioxin seems to cause a general increase in many cancers among exposed populations.[2]

However, a study published during 1998 made it clear that dioxin can cause breast cancer in rats without either initiating it or promoting it in the traditional sense. As we reported earlier (*REHW #630*), researchers in the U.K. exposed pregnant rats to small amounts of dioxin on the 15th day of pregnancy.[7]

The female offspring of the dioxin-exposed pregnant rats were born normal, but by the time they were 7 weeks old, their mammary glands had developed an unusually high number of "terminal end buds" -- the places in a breast where breast cancers develop. Four studies have shown that there is a direct correlation between the number of terminal end buds in a breast and its susceptibility to breast cancer.

The British researchers went on to expose these young rats (and a control group) to a well-known carcinogenic chemical, dimethylbenz[a]anthracene. The dioxin-exposed young rats developed many more breast cancers than did the control group.

Thus a chemical (like dioxin) that, under some circumstances, appears to protect against breast cancer may, in fact, under other circumstances, cause it.

Based on non-cancer health effects, the World Health Organization's meeting on dioxin in May, 1998, recommended that the "tolerable daily intake" of dioxin should be between 1 and 4 picograms per kilogram of body weight per day (pg/kg/day). To reach this number, they took the lowest observed level that caused problems in laboratory animals and reduced it by a safety factor of 10. Normal practice in such circumstances would be to apply a safety factor of 100, but, according to a knowledgable source who asked not to be quoted, if the WHO group had applied a safety factor of 100 they would have been declaring much of the food supply in industrial countries dangerously contaminated, which they were reluctant to do for political reasons.

The middle of the range that they adopted -- one to 4 pg/kg/day -- would be 2.5 pg/kg/day, 4 times as low as the World Health Organization's 1990 recommendation, which was 10 pg/kg/day as the tolerable daily intake. Thus the tolerable daily intake recommended at the May meeting for an adult weighing 70 kg (154 pounds) would be 2.5 x 70 = 175 picograms per day, or 175 x 365 = 63,875 picograms per year.

Now that we know that a picogram of dioxin has some public health significance, we are in a better position to appreciate that 3000 grams of dioxin emitted each year by industrial sources in the U.S. is a very substantial quantity. If we multiply 3000 grams by a trillion to turn it into picograms, then divide by the U.S. population (260 million), we can see that 3000 grams of dioxin TEQ represents 11 million picograms of dioxin TEQ for each man, woman and child in the U.S. each year.

Scientists at the May, 1998, World Health Organization meeting concluded that, based on animal experiments, the following effects might be expected in humans: decreased sperm counts might be expected in humans who have a daily dioxin intake of 14 pg/kg/day; learning disabilities and endometriosis might be expected in humans with a dioxin intake of 21 pg/kg/day; suppression of the immune system might be expected in offspring of humans with an intake of 37 pg/kg/day.[3,pg.25] The May, 1998 WHO meeting, "recognized that subtle effects may already occur in the general population in developed countries at current background levels, 2 to 6 pg/kg body weight. They therefore recommended that every effort should be made to reduce [dioxin] exposure to the lowest possible level," according to a statement released by the World Health Organization.[3]

All together, not very reassuring news from Europe about dioxin, we conclude.

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[1] Jean A. Grassman and others, "Animal Models of Human Response to Dioxins," *Environmental Health Perspectives* Vol. 106, Supplement 2 (April 1998), pgs. 761-775. There are 75 polychlorinated dibenzodioxins (PCDDs), the most potent of which is TCDD; plus 135 polychlorinated dibenzofurans (PCDFs), plus 9 PCBs (polychlorinated biphenyls) that are structurally similar to PCDDs and PCDFs.

[2] Douglas B. McGregor and others, "An IARC Evaluation of Polychlorinated Dibenzo-*p*-dioxins and Polychlorinated Dibenzofurans as Risk Factors in Human Carcinogenesis," *Environmental Health Perspectives* Vol. 106, Supplement 2 (April 1998), pgs. 755-760.

[3] "Executive Summary; Assessment of the health risk of dioxins: re-evaluation of the Tolerable Daily Intake (TDI); WHO Consultation, May 25-29 1998, Geneva, Switzerland." World Health Organization, WHO European Centre for Environment and Health, International Programme on Chemical Safety. December, 1998. This paper is marked as follows: "This report does not constitute a formal WHO publication. It should not be quoted or cited and is for personal use only!" See http://www.who.org/inf-pr-1998/en/pr98-45.html. We can send this paper free as an Adobe acrobat file to anyone who requests is by E-mail. If you want the paper by U.S. mail, please send $3.00 to cover postage and handling.

[4] Heiko Becher, Karen Steindorf, and Dieter Flesch-Janys, "Quantitative Cancer Risk Assessment for Dioxins Using an Occupational Cohort," *Environmental Health Perspectives* Vol. 106, Supplement 2 (April 1998), pgs. 663-670.

[5] H. Muto and Y. Takizawa, "Dioxins in Cigarette Smoke," *Archives of Environmental Health* Vol. 44, No. 3 (May/June 1989), pgs. 171-174.

[6] U.S. Environmental Protection Agency, *The Inventory of Sources of Dioxin in the United States* [EPA/600/P-98/002Aa External Review Draft] (Washington, D.C.: U.S. Environmental Protection Agency, April, 1998).

[7] Nadine M. Brown and others, "Prenatal TCDD and predisposition to mammary cancer in rats," *Carcinogenesis* Vol. 19, No. 9 (1998), pgs. 1623-1629.

***Rachel's Environment & Health Weekly*** (ISSN 1078-103x) is published weekly by Environmental Research Foundation at 612 Third Street - Suite 2A, Annapolis, MD 21403-3246. Second-Class Postage paid at Annapolis, MD. **POSTMASTER: Send address changes to *RACHEL'S ENVIRONMENT & HEALTH WEEKLY*, P.O. Box 5036, Annapolis, MD 21403-7036.** Peter Montague, editor (National Writers Union, UAW Local 1981/AFL-CIO); Maria B. Pellerano, associate editor. RATES: $25 per year for individuals and citizen groups; $45 for universities and libraries; $80 for professionals and government agencies; $15 for students and seniors; $400 for businesses; in Canada and Mexico, add $8.00; in all other countries, add $15.00. All payments in U.S. funds drawn on U.S. banks. Visa & Mastercard accepted. Telephone (410) 263-1584; fax: (410) 263-8944; E-mail: erf@rachel.org. *Rachel's Environment & Health Weekly* is not copyrighted. Printed on kenaf paper (100% acid-free, chlorine-free, and tree-free).

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Rachel's **Environment & Health Weekly #645**

*Providing news and resources for environmental justice -- April 8, 1999*

## EXCREMENT HAPPENS--Part 2

Continuing from last week, we are retelling the history of the management of human excrement as originally narrated by Abby A. Rockefeller.[1] Where we have added new facts to Ms. Rockefeller's original history, they appear inside square brackets.

* * *

To recap where we are: Cities began to provide running water into homes in the early 19th century. Water piped into homes had to be piped out again, often into open sewer ditches running in the streets. Outbreaks of cholera followed. A debate ensued: should sewage be transported back to farms, where the nutrients had originated, or should it be disposed of by dumping it into bodies of water? Although many cities for a time transported sewage to farms, by 1920 most sewage was being piped directly into bodies of water. This was a crucial choice.

Once the network of sewer pipes began to grow, industry saw these public pipes as a cheap place to dump industrial wastes. As a result, corporations began to dump all manner of toxicants into the nutrient-rich sewage stream. This was another crucial choice. Once they were mixed together, nutrients and industrial poisons could not be separated at any reasonable price. Therefore the whole mess became a toxic waste disposal problem and excrement lost its value as a fertilizer. Dumping it into water bodies accelerated.

By the 1950s, most of the nation's waterways were badly contaminated with a combination of nutrients and toxicants. This gave rise to a demand for treatment of waste prior to disposal. Pipes that used to carry toxic sewage into streams and oceans now began to carry it into centralized "wastewater treatment plants" or "publicly owned treatment works" (POTWs).

Wastewater treatment plants remove the solids and some of the chemicals, creating a black, mud-like "sludge" in the process. It's a trade-off: improved wastewater treatment means cleaner discharge water but it also means more sludge and worse sludge (more toxic). Now a new, and truly intractable, problem appears: what to do with mountains of toxic sludge?

Communities with access to the ocean began dumping sludge there. New York dumped its sewage sludge 12 miles offshore; when that place developed obvious contamination problems, the dumping was moved to a spot 106 miles offshore, where, to no one's surprise, contamination soon developed.

The use of water to carry sewage, and the use of centralized wastewater treatment plants, had great political appeal for several reasons. Most political authorities tend to favor centralized solutions because they basically don't trust people to handle their own problems. Secondly, as we have noted, industry needed a cheap place to dispose of its wastes. [In 1997, according to the Congressional Research Service, industry "dumped 240 million pounds of wastes with hazardous components" into municipal sewers.[2]] Third, and perhaps most important, laying sewer pipes and building centralized sewage treatment plants is extremely costly and engineering firms receive 20% of the initial cost. [Between 1970 and 1993, the federal government appropriated $69.5 billion for sewage construction projects. The Congressional Research Service recently estimated that between now and the year 2016 (17 years), the federal government will spend another $126 billion on sewage projects.[2] These are serious amounts of money.] Only the Federal Highway Administration [and the military] spend more public money on construction. [If even a small fraction of this sewer money is kicked back at election time by consultants, lawyers, investment bankers and engineering firms, it can go a long way toward keeping the present crop of politicians in office.]

In the 1970s, many environmentalists and public health officials favored centralized sewage treatment because it seemed to offer an improvement over dumping raw wastes into waterways. The Clean Water Act of 1977 was essentially a sewering act. Everyone was then locked into centralized wastewater treatment systems.

In 1988, Congress discovered that sludge dumping in the oceans was harming marine life, and the practice was banned as of 1992. This created a massive problem for American cities: [11.6 billion pounds of sludge (that's the dry weight, not counting the water it contains[3]) has to go somewhere, year after year.]

At that moment, EPA decided that the U.S. now needs to mimic 100 generations of successful farmers in Asia, returning human excrement to farmland.

However, EPA has overlooked two important differences between modern sewage sludge and traditional "night soil" (unadulterated human waste):

1) Most of the nitrogen in human waste is in the urine and is water-soluble, so it is not captured in the sludge. Therefore, if sludge is going to substitute for commercial fertilizer, you have to use a lot of it to get enough nitrogen. And (2) when you add a lot of sludge to soil, you are also adding a lot of toxic metals and a rich (though very poorly understood) mixture of organic chemicals and, very likely, radioactive wastes as well.

EPA has addressed the toxic metals by telling farmers to add lime to their soil along with the sewage sludge, to prevent the soil from becoming acidic. If soil turns acidic, then toxic metals begin to move around, either leaching down into groundwater or moving upward into the crops (which, by definition, are part of some food chain). If soils are alkaline (the opposite of acidic), the metals move more slowly.

[What EPA has overlooked is the fact that ordinary rain is slightly acidic, not counting the excess acidity provided by "acid rain." Normal rain drops falling through the atmosphere dissolve small amount of carbon dioxide, forming carbonic acid. Normal rain has a pH of 5.6 whereas 7 is neutral. Therefore, if soils are not kept alkaline by the regular addition of lime, sooner or later normal rain will begin to leach excess metals out of many soils. The only way to prevent this is to keep the excess metals out of soils in the first place.]

In sum, plowing sewage sludge into soils is essentially guaranteed to harm many of those soils as time passes. [See REHW #561.] [As we know from the ancients who

poisoned their soils with irrigation salts, a nation that poisons its farmland is a nation that doesn't have a long-term future.]

A series of bad decisions made during this century has brought us to an impasse: sewage sludge is unmanageable because you can't know from day to day what is going to be in it, and so you cannot monitor its contents.[4] (Even if you could manage the scientific problems inherent in monitoring an unknown mixture of unknown substances, as a practical matter there isn't any government agency with enough staff to monitor the nation's sludge.)

Therefore -- as heroic a task as this may seem -- it is time to re-think centralized water-carriage sewage treatment systems. The present systems were not designed to produce useable products and therefore the *design* of present systems is the root of the problem.

Three policy goals are needed:[4] (1) Sewer avoidance (stay off or get off water-carriage, centralized sewer systems). (2) Promote low-cost, on-site resource recycling technologies, such as composting toilets, that avoid polluting water and preclude wasting resources. (3) Price water correctly so that the market works to keep it clean, not contaminate it with excreta.

[For individual households, real solutions are already available: zero discharge household waste systems. An excellent new book by David del Porto and Carol Steinfeld, *The Composting Toilet System*, will dispel any fears you may have that composting toilets are a step backward.[5] With microflush toilets and vacuum-flush toilets now readily available, you can have the bathroom of your dreams, yet compost your household wastes into a clean, odor-free product that is entirely satisfactory as agricultural fertilizer. These days, there are companies that will manage the system for you, including removing the compost. Your household waste system can be installed, maintained, and managed by professionals, just like your electrical and heating systems.

But what about apartment buildings and office buildings in cities? Although we know of no one who has applied it, the technology certainly exists for manufacturing building-scale waste systems based on anaerobic digesters, which would produce methane gas and fertilizer. As Abby A. Rockefeller said recently in an interview, "Surely, human ingenuity can do this." Such systems would be cheaper than current sewage systems because they wouldn't require miles of underground pipes to connect to a centralized sewage treatment plant, and they would conserve hundreds of billions of gallons of water each year.

[Every time we flush the toilet, 3.3 gallons of drinking water are degraded. At 5.2 flushes per day (average), each of us presently degrades 6260 gallons of drinking water each year to flush away our 1300 pounds of excrement -- 1.6 trillion gallons of water per year in the U.S.]

Naturally, we would need to keep toxicants out of these composting systems, but that has always been true (even though we have ignored this fact) and we might as well face up to it now. Toxic household products will have to be phased out as part of any plan for sustainable living.

Toxic industrial wastes should be managed by the industries that make them, not dumped into the environment that sustains all life. Unusable wastes are a sure sign of inefficiency.

Lastly, what to do with today's mountains of toxic sludge? They must be handled as hazardous wastes because that's what they are. [Probably above-ground storage in concrete buildings is the only satisfactory solution at the present time. (See *REHW #260.*)]

[You say we can't do any of this because we've been doing it another way for 100 years? Ask yourself, what kind of people would dump their excreta into their drinking water in the first place? And what kind of people, faced with workable, cheaper, more environmentally sound alternatives would continue to insist that dumping their excreta into their drinking water is the only way to live?]

[1] Abby A. Rockefeller, "Civilization and Sludge: Notes on the History of the Management of Human Excreta," *Current World Leaders* Vol. 39, No. 6 (December 1996), pgs. 99-113. Ms. Rockefeller is president of the ReSource Institute for Low Entropy Systems, 179 Boylston St., Boston, MA 02130; telephone (617) 524-7258.

[2] Claudia Copeland, *Wastewater Treatment: Overview and Background* [98-323 ENR] (Washington, D.C.: Congressional Research Service, January 20, 1999). Available at: http://www.cnie.org/nle/h2o-29.html.

[3] Gary D. Krauss and Albert L. Page, "Wastewater, Sludge and Food Crops," *Biocycle* (February 1997), pgs. 74-82. Krauss was staff director for the National Research Council study, *Use of Reclaimed Water and Sludge in Food Crop Production* (Washington, D.C.: National Academy Press, 1996).

[4] Robert Goodland and Abby Rockefeller, "What is Environmental Sustainability in Sanitation?" *IETC's Insight* [newsletter of the United Nations Environment Programme, International Environmental Technology Centre] Summer, 1996), pgs. 5-8. The International Environmental Technology Centre can be reached at: UNEP-IETC, 2-1110 Ryokuchikoen, Tsurumi-ku, Osaka 538, Japan. Telephone: (81-6) 915-4580; fax: (81-6) 915-0304; E-mail: cstrohma@unep.or.jp; URL: http://www.unep.or.jp/. See also Abby A. Rockefeller, "Sewage Treatment Plants vs. the Environment," an unpublished paper dated September, 1997. And: Abby A. Rockefeller, "Sludge is Sludge; The Illusion of Safety," an unpublished paper dated June 26, 1996.

[5] David Del Porto and Carol Steinfeld, *The Composting Toilet System Book* (Concord, Mass.: Center for Ecological Pollution Prevention, 1999). ISBN 0-9666783-0-3. See http://www.ecological-engineering.com/ctbook.html. $29.95 plus $3.30 shipping ($12 overseas shipping) from: Center for Ecological Pollution Prevention, 50 Beharrell St., P.O. Box 1330, Concord, Mass. USA 01742. Phone (978) 369-9440. Fax: (978) 368-2484. E-mail: ecop2@hotmail.com. See also: Carol Steinfeld, "Composting Toilets Come to the Rescue in Massachusetts," *Biocycle* (April 1996), pgs. unknown. See http://www.ecological-engineering.com/rescue.html. And see: Carol Steinfeld, "Composting Toilets Emerge as Viable Alternatives," Environmental Design & Construction (July/August 1998), pgs. unknown. See http://www.edcmag.com/-archives/7-98-14.htm.

*Rachel's Environment & Health Weekly* (ISSN 1078-103x) is published weekly by Environmental Research Foundation at 612 Third Street - Suite 2A, Annapolis, MD 21403-3246. Second-Class Postage paid at Annapolis, MD. **POSTMASTER: Send address changes to *RACHEL'S ENVIRONMENT & HEALTH WEEKLY*, P.O. Box 5036, Annapolis, MD 21403-7036.** Peter Montague, editor (National Writers Union, UAW Local 1981/AFL-CIO); Maria B. Pellerano, associate editor. RATES: $25 per year for individuals and citizen groups; $45 for universities and libraries; $80 for professionals and government agencies; $15 for students and seniors; $400 for businesses; in Canada and Mexico, add $8.00; in all other countries, add $15.00. All payments in U.S. funds drawn on U.S. banks. Visa & Mastercard accepted. Telephone (410) 263-1584; fax: (410) 263-8944; E-mail: erf@rachel.org. *Rachel's Environment & Health Weekly* is not copyrighted. Printed on kenaf paper (100% acid-free, chlorine-free, and tree-free).

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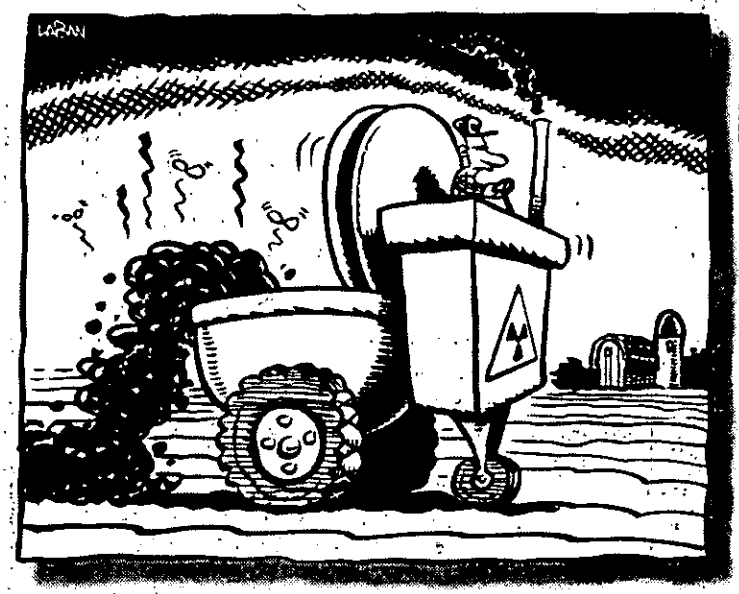
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# Toxic Avengers

## The EPA is pushing hazardous sludge as fertilizer. The locals are fighting back.




TERRY LABAN

By Laura Orlando

It all started with the Clean Water Act. In 1972, the federal government decided to get tough by regulating waste discharged from municipal sewage treatment plants. Because every plant in the United States had a pipeline dumping noxious waste into a body of water, Congress mandated and funded upgraded treatment processes. Improving treatment meant cleaner wastewater at the end of the pipe, but it elevated the level of contaminants in the dregs of the process—the mud-like toxic waste called sludge. Between 1972 and 1987, $60 billion was spent by municipalities to build and upgrade treatment plants, which now produce about 8 million dry tons of sludge annually.

Sewage is a mixture of whatever is flushed down toilets, runs off roads, is disposed of by industries and enters one of the nation's 16,000 publicly owned treatment plants. After treatment, the liquid component, wastewater, is discharged into the nearest body of water. Sludge, the semisolid residual, is everything leftover, including an unpredictable mix of heavy metals, synthetic chemicals, radioactive waste, medicines and so on.

For years, most cities on the coasts simply dumped their sludge into the ocean. This practice ended after garbage and syringes washed up on New York and New Jersey beaches in the summer of 1987. Contrary to public perception, the garbage had nothing to do with sludge dumping from barges 12 miles from the shore, but lawmakers swiftly responded to pressure from environmentalists with the Ocean Dumping Ban Act, which outlawed the transportation and dumping of sludge into the ocean after 1991. New York and New Jersey, however, still needed a place to put the 11 million wet tons of sludge they were dumping each year.

Enter the Environmental Protection Agency: A year after ocean dumping was banned, the EPA rewrote the rules governing disposal of sewage sludge, reclassifying the noxious stuff from a hazardous material to a "safe" fertilizer. Sludge also underwent a linguistic detoxification and marketing makeover—sludge became "biosolids" and disposal became "beneficial use." By 1993, the EPA had formulated the National Biosolids Management Program to promote sewage sludge as fertilizer. Now, more than 2.5 million tons of sludge are being spread on land each year.

The EPA regulates only 21 of the countless pollutants in sludge, leaving thousands of contaminants, like dioxin and PCBs, unregulated and headed for gardens and farmland. Even the notion that sludge is a useful fertilizer—as a source of nitrogen—is phony. In the billions of gallons of wastewater and mounds of sludge, there is human excreta and, in that, nitrogen. But only tertiary (or advanced) treatment—used by less than a third of U.S. treatment plants—has the capacity to remove nitrogen from wastewater and put it in sludge. And the more thorough the treatment process, the more toxic the sludge. "The EPA required the petroleum and automotive industries to change the way they do business and to decrease the amount of environmental lead pollution that was occurring due to lead and gasoline," says Stanley Tackett, an expert on the effects of lead in the environment. "It's ironic now that one application of sewage sludge to a field puts more lead in the soil than did the 60 years of driving by the field with leaded gasoline."

The waste management industry profits handsomely from the EPA's sludge-as-fertilizer ruse. These "refuse collectors" are hired by treatment plants to haul and spread sludge. Between 1992 and 2002, New York City alone expects to spend more than $2.5 billion on sludge management programs. A large part of this money will go to contractors like Browning-Ferris Industries and WMX Technologies, which haul hundreds of tons of sludge as far away as Texas every day.

Farmers take sludge because they are hoodwinked into thinking it's a good fertilizer. They get it for free or at a nominal charge, with treatment plants paying for its transportation, application and the necessary monitoring and record-keeping. Some farmers are even paid to take it. Once spread, however, all liability for putting the poison on the land transfers to the landowner.

As the horror stories mount—such as Vermont dairy farmer Robert Ruane's, who watched his cows die from eating sludge-contaminated soil and feed—word is getting out that toxic sludge is incompatible with agriculture. At the local level, people are challenging the EPA's sludge disposal policies. "The sludge industry says they have to comply with strict state and federal rules," says Helane Shields of the anti-sludge group Citizens For Future New Hampshire. "Let's consider this analogy: A state trooper pulls you over and tells you, 'You have to comply with strict speed limits,' then tells you to go on your way and don't go any faster than 170 miles per hour. That is exactly what is happening with EPA and New Hampshire sludge rules."

New Hampshire produces about 24,000 tons of sludge each year. But the state's "open-door policy" allows the import of sludge from states like Massachusetts with stricter environmental regulations. Half of the sewage sludge being dumped in New Hampshire is coming from out of state. Shields says that without federal or state regulations, "the only way you can protect yourself is by enacting local ordinances or bans."

Local control is the big issue facing sludge opponents across the country. In New Hampshire, 44 towns have stopped or restricted sludge spreading through various local mechanisms. In neighboring Vermont, where 40 percent of the state's sludge is spread on land, getting local control over sludge processing and disposal has been a rallying point for groups such as Rural Vermont and East Montpelier's Citizens for Clean Compost. In East Montpelier, residents voted overwhelmingly to stop construction of a sludge composting plant. The nonbinding vote—taken by the city government to gauge public opinion—was ignored by city officials. But residents have managed to tie up the permitting process, temporarily halting construction. The Clean Land Campaign was formed in July 1998 to help push responsible sludge legislation—such as giving towns the right to a binding vote on sludge composting facilities—through the Vermont legislature.

California, where 1.8 million tons of sludge is dumped on farmland each year, has the best record for turning the sludge haulers away. County by county, Californians have exerted control over the spreading of sludge, and have gotten local bans and ordinances that put restrictions on its disposal. Three counties—San Bernardino, Stanislaus and San Joaquin—have banned it outright.

Another promising strategy is the tracking of sludge applications. Such disclosure will not only make farmers think twice before accepting sludge and alert opponents to its whereabouts, but may also influence the future value of the land. "When pesticides are used in California, a permit is filed in the agricultural commissioner's office and an application report is completed by the supplier," says Jane Beswick, a dairy farmer and coordinator of the Coalition for Sludge Education. "The parcel is therefore tagged and anyone interested can find out who has used what pesticide where. Tagging the parcel when sludge is spread would make it possible for any future purchaser or tenant to know whether sludge had ever been used."

In San Luis Obispo County, David Broadwater learned about a plan by Bio Gro, one of the 530 subsidiaries of WMX Technologies, to spread 17,000 tons of sludge annually on local ranches. Taking Bio Gro by surprise, Broadwater lobbied the regional water board to require an Environmental Impact Report for the project. Bio Gro decided not to pursue the report, stopping the dumping.

## Radioactive Sludge

Adrienne Anderson says that the Environmental Protection Agency's reclassification of sludge as a safe fertilizer has created a loophole "large enough to drive nuclear weapons waste dump trucks through."

Anderson was one of only two members of Denver's Metro Waste Water Reclamation District board to oppose an EPA plan to take radioactive groundwater from the Lowry Landfill Superfund site in nearby Arapahoe County, run it through a pipeline to the Denver municipal waste treatment system and spread the resulting radioactive sludge on a city-owned 41,000-acre farm just outside of town. Lowry was the dumping ground for other Colorado Superfund sites, and it includes hazardous waste from the Rocky Mountain Arsenal, which produced nerve gas, Martin Marietta's Titan Missile program and Coors' nuclear fuel rod making days. The pipeline is a convenient way to transfer liability to the public and rid the Department of Energy of a nasty problem.

The EPA has approved the disposal of wastewater from 32 other Superfund sites into municipal sewer systems across the country, but Lowry is the only one known to contain plutonium. The EPA and DOE continue to deny that the plutonium contamination at Lowry is out of the ordinary. Indeed, an EPA contractor at the Lowry site, CH2M Hill, attributed plutonium readings to "cosmic dust falling from space." Yet Anderson has found an index of 8,800 secret government documents related to Lowry. The listing, mostly blacked out because of claims of national security, demonstrates that there was "significant activity to deny the presence of plutonium," Anderson says.

In July 1998, Denver Mayor Wellington Webb decided to get rid of his own little problem by dismissing Anderson from the water board. She now has a whistleblower case pending with the Labor Department. Without her around, the water board has proposed allowing plutonium to be pumped into the sewer lines at levels 160 times higher than Colorado's drinking water standard for plutonium. Colorado already is the only state that sets any "acceptable" level for plutonium. And the board has rebuffed demands by citizen and environmental groups for a public hearing on the issue. The pipeline has been completed and, as plans now stand, Lowry wastewater will be pumped into Metro's sewage system later this year. **L.O.**

Of course, turning back the sludge trucks is just the first step. Unless sludge is treated with the precautions and regulations other hazardous wastes now receive, polluters will always find another field. The EPA's sludge disposal policy must be changed if this serious form of pollution is to stop being shuffled from county to county and from industry to the public. "The EPA is putting pressure on the state to control local folks," Broadwater warns. "A big steamroller is coming." ■

**Laura Orlando** *is executive director of the ReSource Institute for Low Entropy Systems in Boston.*

Attachment Q

**State of New Hampshire**
**DEPARTMENT OF ENVIRONMENTAL SERVICES**
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603) 271-3503 FAX (603) 271-2867

May 5, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Rm 102
Concord, NH 03301

**Re:** ***Proposed amendments to SB 218, regulating the land application of sewage sludge***

Dear Chairman Russman:

The Department of Environmental Services (DES) wishes to thank the Committee for the opportunity to comment on proposed amendment to SB 218 offered by Senator Wheeler at the hearing held April 1, 1999. The amendment does not change the essence of the bill. The Department does not support this legislation, with or without amendment. As requested, we offer our analysis of the specific changes to the bill by the proposed amendment. Our previous letter of testimony (copy attached) remains generally applicable.

The attached table, developed by DES staff, provides a detailed comparison of the proposed provisions of SB 218, as amended, to Env-Ws 800. The table is the same as our previous table, except for highlighted portions. Also enclosed for your information is a summary of DES consideration of the dioxin standard which was made public during the rulemaking process, and a summary of the proposed DES process for further rulemaking.

The amendment changes the applicability of certain land application restrictions from all sludge to "Class B sludge". Although "Class B sludge" is not defined, the federal definition applies only to the level of reduction human pathogen indicators in the sludge. The use of the term in the amendment seems to imply a difference in chemical quality standards between class A and class B, which is not the case in federal or state regulations. DES proposes to undertake further rulemaking for risk-based chemical quality standards for both classes of sludge.

The amendment proposes prohibition of class B sewage sludge or industrial paper mill sludge for reclamation of gravel pits above aquifers. Neither "gravel pit" nor "aquifer" is defined, which would make interpretation difficult. In any case, it is the leachable constituents of any sludge mixture which should be closely regulated when the material is used for reclamation, not the origin of the sludge. The new DES regulations take this approach, with further refinement to follow in the next rulemaking. All New Hampshire groundwater is considered a potential drinking water supply, not just "aquifers", so the same stringent measure of groundwater protection should be afforded everywhere, as it is in the new sludge rules.

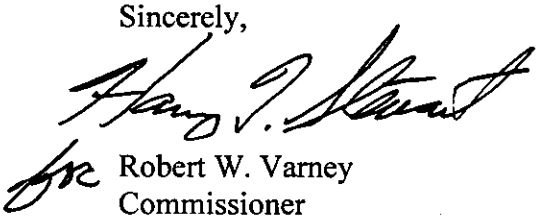
The amendment proposes to impose sludge standards for metals as of January 1, 2001, which were proposed by DES in an early rulemaking draft, and subsequently deleted as a result of comments received. In short, the proposed metals limits would have neither the effect of protection, nor of instituting better sludge quality, but only the effect of arbitrarily restricting land application of sewage sludge without clear significant benefit to human health or the environment. In the new rules, DES has adopted the approach of encouraging better sludge quality through incentives for cleaner sludge and a program for working cooperatively with municipal facilities to achieve this goal.

The amendment proposes a dioxin standard of "dioxins TEQ" of 1 ppt for sludge application on land pasturing livestock or fowl for human consumption. This level is below ambient background levels, attributable to atmospheric deposition or other agricultural practices other than sludge land application, for many NH sites. The result is an arbitrary restriction on land application of sludge to pasturelands. DES proposes to revisit the dioxin standard, with specific additional risk assessment for human consumption of livestock or fowl, in the next rulemaking round.

In conclusion, if SB 218 is passed with or without amendment, the cumulative effects of the proposed requirements will essentially be a ban on the land application of sludge, which does not appear to be the legislative intent. Consequently, we recommend that you vote SB 218 inexpedient to legislate.

Thank you for your consideration. If you have any questions, please contact me at 271-3503 or Paul Currier at 271-2457.

Sincerely,



Robert W. Varney
Commissioner

Attachment
cc: Senator Katherine Wheeler
Senator Burton Cohen
Senator Richard Russman
Senator George Disnard
Senator Lou D'Allesandro
Representative Betty Hall
Representative Derek Owen
H:\LEGIS\SB218AMD.LTR

Attachment R

BFI Organics Testimony on SB 218

I am Alex Duran, an environmental engineer with BFI Organics, one of the firms managing organic residuals in New Hampshire and adjacent New England states. Thank you for this opportunity to provide testimony on SB 218. We are opposed to this bill because it goes too far in restricting the beneficial re-use of residuals which would otherwise be placed in solid waste landfills, adding to the capacity strain already facing those landfills, some of which are owned by BFI. BFI Organic in New Hampshire is principally involved in the land application of paper mill residuals for agricultural and geotechnical applications including fertilizer use in farm fields, capping of closed landfills and reclamation of spent sand and gravel pits.

Several provisions of SB 218 are poorly crafted and unworkable from our perspective, including:

The requirement to provide written notice to all persons "using"; commercial, institutional or residential buildings within a radius of 200 feet around the application area.

The requirement for recording in the Registry of deeds a notice giving specifics of the application project. This requirement may not conform to the existing procedures for content of documents at the various Registries.

The prohibition of disposal of solid waste sludges at a facility permitted by the sludge management rules runs counter to the basic purpose and intent of the recently revised solid waste management rules.

The requirement for maintaining soil pH between 6.5 and 7.0 for 5 years from the date of application is impractical since lime applications, which are commonly required in New Hampshire soils, will often raise the soil pH above 7.0.

The proposed requirement of a 250-foot setback is already in effect for designated rivers under the New Hampshire River Management Act.
The requirements for restrictions of stockpiling on flood plans the requirements for depth of unsaturated soil and for maximum allowable slopes of farm fields are already addressed within the existing DES Sludge Management Rules.

The requirements for POTWS to list all chemical constituents and the restrictions of metal contents in sludges have already been addressed in the recently strengthened existing DES rules.

For these and other reasons stated by BIA, we strongly oppose this attempt to further restrict the beneficial re-use of organic residuals in New Hampshire.

Residuals & Biosolids Group, New England
Willow Hill Professional Building · 160 Dover Road · Suite 7 · Chichester, New Hampshire 03234-6519
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www.bfi.com

30% Post-Consumer

Attachment S

PO Box 563
Bethlehem
NH 03574
May 6, 1999

Dear Members of the Senate Environment Committee:

The landspreading of sludge poses a long term public health and safety risk, in that current practice does not and cannot ensure that hazardous toxins are excluded from the sludge. I am submitting to you a well-researched article on the subject, Rachel's Environment and Health Weekly, #561. Please do take the time to read it.

Under current NH sludge rules, sludge quality certifications, good for 5 years, are issued pursuant to testing "of at least 4 representative samples...taken at least 60 days apart within the 12 months prior".... The frequency of follow-up testing can be as seldom as twice a year, depending on the scale of the treatment operation. Spikes in pollutant loading, depending on the input to the waste water treatment plant on any given day (perhaps a day when a tank truck of septage or landfill leachate is delivered), could go completely undetected under this system. According to Paul Adams in his 1998 study of NH sludge regulation, "The Blue Ribbon Sludge Program", "model sewer use ordinances permit, without notification or penalty, the discharge of up to fifteen kilograms* (*'Fifteen kilograms' = 33 pounds.) per month of hazardous waste to the [wastewater treatment facility]." When you consider that the State has identified approximately 4000 facilities as handling hazardous wastes, the in-state potential alone for contaminating wastewater and generating toxic sludge is staggering. SB218's provision for increased testing, by requiring renewal of certification every 2 rather than 5 years, is a small but important step in the right direction.

The Cornell Waste Management Institute has published a detailed and damning critique of EPA sludge rules in "The Case for Caution: Recommendations for Land Application of Sewage Sludges and An Appraisal of the US EPA's Part 503 Sludge Rules." Current NH DES rules are in fact somewhat more stringent than the inadequate EPA rules, but they fall short of the recommendations proposed in the aforementioned study. Currently DES has two sets of standards for sludge certifications, the more stringent being for so-called "low-metals" sludge. Although it would be more prudent to use the more protective Waste Management Institute recommendations as the starting point for considering sludge regulations, it is another step in the right direction that SB 218 would apply the DES "low-metals" standards to all sludge.

I see that the fiscal note which appears at the end of the original version of SB218 assumes this bill will result in more landfilling of Class B sludge. It is false economy to believe free landspreading is cheaper than $60 a ton for landfilling. If adequate testing were implemented (thoroughly testing every load before it is spread), its cost, coupled with the cost of appropriately rejected loads, would be greater than that of landfilling. When nuclear power was going to be "too cheap to meter"" it was before reactor safety and radioactive waste disposal had been addressed.

It is false economy to cut corners on disposal by dispersing potentially hazardous materials into the environment. Payment will come due someday in the form of contaminated croplands, millions of unusable and unsaleable acres of land, polluted aquifers, wells, lakes, rivers, and streams, an insidiously compromised food chain, and consequences we have not yet begun to imagine. Ask the farmer in Canaan who lost 31 cows after feeding them silage from a sludge-treated field; ask the family and neighbors of the late Shayne Connor of Greenland, where a sludge application seemingly precipitated a suspicious cluster of illnesses, culminating in the death of a young man; ask the people of Newbury impacted by an incident where they were, as planning board member Harry Seidel has stated publicly, "fortunate no one in town died." The costs have already started to come home.

I urge you to support SB 218 as amended by Sen. Wheeler, not because it will make land application of sludge safe but because it will make it safer. A compelling case can be made for a ban on landspreading of sludge, but since there is today no such proposal on the legislative table, please start with SB 218 as a step in the right direction.

Thank you for considering my remarks, and thank you for your public service.

Sincerely,

Katherine Rhoda

Katherine Rhoda

5(cont.)

Please don't think this is an extremely long article - Footnotes begin halfway down page 4.

Electronic Edition

RACHEL'S ENVIRONMENT & HEALTH WEEKLY #561
---August 28, 1997---
HEADLINES:
NEW U.S. WASTE STRATEGY, PT. 2: SEWAGE SLUDGE

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## NEW U.S. WASTE POLICY, PT. 2: SEWAGE SLUDGE

In the mid-1980s, a citizens' organization in New Jersey—Clean Ocean Action, led by Cindy Zipf—launched an aggressive campaign to protect the oceans from the dumping of toxic sewage sludge. They were up against extraordinary power: U.S. Environmental Protection Agency (EPA) opposed them; New York and New Jersey environmental officials opposed them; nearly every municipal government opposed them. But they persevered and won.

Thus in the early 1990s, municipalities had to find other places to dump their sewage sludge.

As we saw last week, sewage sludge is the mud-like material that remains after bacteria have digested the human wastes that flow from your toilet into your local sewage treatment plant. If human wastes were the only substances entering the sewage treatment plant, then sewage sludge would contain only nutrients and should be returned to the land.

Unfortunately, most sewage treatment plants receive industrial toxic wastes, which are then mixed with the human wastes, creating a poorly-understood mixture of nutrients and industrial poisons. Furthermore, many American cities have built sewage systems that mix storm water runoff with the regular sewage; every time a rain storm scours these cities' streets, additional toxins are added to the sewage sludge.

As a result, sewage sludge contains a strange brew of nutrients laced with low levels of PCBs [polychlorinated biphenyls]; dioxins and furans; chlorinated pesticides [such as DDT, DDD, DDE, dieldrin, aldrin, endrin, chlordane, heptachlor, lindane, mirex, kepone, 2,4,5-T, and 2,4-D]; carcinogenic polynuclear aromatic hydrocarbons [PAHs]; heavy

metals [arsenic, mercury, lead, selenium, cadmium, etc.]; bacteria, viruses, parasitic worms, and fungi;[1] industrial solvents; asbestos; petroleum products, and on and on. American industry uses roughly 70,000 different chemicals and any of these can be found in sewage sludge—depending on who's pouring what down the drain at any given time and place. In addition to the original chemicals, unique metabolites and degradation products develop anew in sludge. To give but one example: trimethylamine can be converted to the powerful carcinogen, dimethylnitrosamine.[2]

The U.S. produces 5.3 million metric tonnes (11.6 billion pounds) of sewage sludge each year (that's dry weight, not including the weight of the water that carries it). Today about 16% of U.S. sewage sludge is incinerated and the ashes are buried in landfills; 38% of sludge is landfilled directly; 36% is spread onto farmland or forest land or otherwise mixed into soils; and 10% is handled in other ways (piled on the land and abandoned, for example).[3]

The sewage treatment industry—and the municipal governments that employ them—represent a powerful political force in the U.S. Together in the late 1980s they figured out that the cheapest thing to do with sewage sludge is to spread it onto or into the land, preferably as close to its point of origin as possible, to minimize transport costs.

However, there were obstacles to overcome. The public thinks of sewage sludge as dirty, smelly and dangerous. Few people thought sewage sludge sounded good as fertilizer for food. So the industry hired a public relations firm, Powell Tate, and renamed sewage sludge "biosolids." They convinced U.S. Environmental Protection Agency (EPA) to go along with this verbal detoxification. The Federation of Sewage Works Associations also renamed itself—they are now the Water Environment Federation (WEF).[4]

The scientific literature on sewage sludge is large, but much of it consists of articles intended to break down public resistance to the use of sewage sludge on farm land. It is "happy literature," not necessarily honest literature. Nevertheless, there is a core of serious research that has tried to discover what the consequences might be if farmers adopted sewage sludge as fertilizer. In recent months, we have examined this literature, and here is what we found:

** Sewage sludge is mutagenic (it causes inheritable genetic changes in organisms),[5,6] but no one seems sure what this means for human or animal health. In its regulations for sewage sludge, EPA has simply ignored this information.[7,8]

** Two-thirds of sewage sludge contains asbestos. Because sludge is often applied to the land dry, asbestos may be a real health danger to farmers, neighbors and their children.[9,10,11] In its sludge regulations, EPA does not mention asbestos.[7,8]

** EPA issued numeric standards for 10 metals (arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc).[8] However, the movement of metals from soils into groundwater, surface water, plants, and wildlife—and of the hundreds of other toxins in sludge, which EPA chose not to regulate—are poorly understood.[12] Their movement depends upon at least the following factors: plant species, soil type, soil moisture, soil acidity or alkalinity, sludge application rate, slope, drainage, and the specific chemistry of the toxins and of the sludge itself.[13,14]

** Soil acidity seems to be the key factor in promoting or retarding the movement of toxic metals into groundwater, wildlife, and crops.[15,16] In creating its regulations, EPA assumed that sludge-treated land would be under the perpetual care of a farmer who would lime the soil to keep it alkaline and prevent the metals from moving dangerously. For this reason, a buildup of toxic heavy metals in soils is often dismissed as irrelevant. But in the real world, farmers go out of business while acid precipitation keeps soaking soils with dilute acid year after year. A buildup of toxic heavy metals in soil today[17] seems to be a prescription for trouble 30 to 50 years down the road.[18]

The National Research Council (NRC) of the National Academy of Sciences gives sewage sludge treatment of soils a clean bill of health in the short term, "as long as... acidic soils are agronomically managed." However the NRC acknowledges that toxic heavy metals and persistent organic pollutants can build up in treated soils: "Potentially harmful trace elements and certain persistent organic chemicals in raw municipal wastewater become concentrated in the sludge during the treatment process, and, with repeated applications of sludge to the land, these chemicals may accumulate in the soil," says the NRC.[3] If such a buildup occurs and the soils are no longer "agronomically managed" but are left alone to be washed by acid rain in perpetuity, what will happen then?

** Research clearly shows that, under some conditions (which are not fully understood), toxic metals and organic industrial poisons can be transferred from sludge-treated soils into crops.[19] Lettuce, spinach, cabbage, Swiss chard, and carrots have all been shown to accumulate toxic metals and/or toxic chlorinated hydrocarbons when grown on soils treated with sewage sludge.[20,21,22,23,24]

** In some instances, toxic organics contaminate the leafy parts of plants by simply volatilizing out of the sludge.[2]

** There is good reason to believe that livestock grazing on

plants treated with sewage sludge will ingest the pollutants

- either through the grazed plants, or by eating sewage sludge along with the plants. Sheep eating cabbage grown on sludge developed lesions of the liver and thyroid gland. Pigs grown on corn treated with sludge had elevated levels of cadmium in their tissues.[25] Cows, goats, and sheep are also likely to eat sludge directly. In grazing, these animals may pull up plants by the roots and thus ingest substantial quantities of soil. A cow may ingest as much as 500 kg (1100 pounds) of soil each year.[26]

** Small mammals have been shown to accumulate heavy metals after sewage sludge was applied to forest lands. Shrews, shrew-moles, and deer mice absorbed metals from sludge.[27] Insects in the soil absorb toxins, which then accumulate in birds.[28]

** It has been shown that sewage sludge applied to soils can increase the dioxin intake of humans eating beef (or cow's milk) produced from those soils.[29,30] Humans in the industrial world already carry unsafe burdens of dioxin in their bodies, according to EPA. (See REHW #390, #391, and #414.) From a public health perspective, any unnecessary addition of dioxin to human food chains is unthinkable and unacceptable.

** Sewage sludge is produced in the huge quantities day after day, year after year. Sludge never takes a holiday.

Municipalities find themselves under relentless pressure to get rid of the stuff, day after day after day. It is exceedingly expensive to treat it to clean it up. Towns and cities have every inducement to cut corners, skimp on tests, fudge the numbers, claim that their sludge is cleaner than it really is. Farmers have no capacity to analyze sludge independently; they must rely on the word of the sludge supplier. Only an aggressive, independent oversight agency can protect public health. Where can such an agency be found? Who has confidence that their state government, or U.S. EPA, will play that role?

EPA has acknowledged that it hasn't adequate funding to oversee the nation's sewage sludge management program.[31,32] "At headquarters, staff has been cut dramatically over the last year, and we can only do so much," one EPA official told BIOCYCLE magazine.[31] And a Washington state official said, "...with EPA cutting back from financing the sludge program, the problem will be whether state or local officials have the resources to adequately oversee every [sludge] application site."[3]

Who, then, will protect public health from the purveyors of toxic sludge? Who will protect the nation's agricultural soils from contamination, providing food security for future generations?

And, finally, who will lead the transition to a truly sustainable way of managing human waste?[33]

- Peter Montague

(National Writers Union, UAW Local 1981/AFL-CIO)

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[1] Herbert R. Pahren and others, "Health risks associated with land application of municipal sludge," JOURNAL OF THE WATER POLLUTION CONTROL FEDERATION Vol. 51, No. 11 (November 1979), pgs. 2588-2601.

[2] J.G. Babish, D.J. Lisk and others, ORGANIC TOXICANTS AND PATHOGENS IN SEWAGE SLUDGE AND THEIR ENVIRONMENTAL EFFECTS [Special Report No. 42] (Ithaca, N.Y.: Cornell University, December, 1981).

[3] Gary D. Krauss and Albert L. Page, "Wastewater, Sludge and Food Crops," BIOCYCLE (February 1997), pgs. 74-82. Krauss was staff director for the National Research Council study, USE OF RECLAIMED WATER AND SLUDGE IN FOOD CROP PRODUCTION (Washington, D.C.: National Academy Press, 1996).

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[5] K.C. Donnelly and others, "Mutagenic Potential of Municipal Sewage Sludge Amended soils," WATER, AIR AND SOIL POLLUTION Vol. 48 (1989), pgs. 435-449.

[6] Philip K. Hopke and others, "Comparison of the Mutagenicity of Sewage Sludges," ENVIRONMENTAL SCIENCE & TECHNOLOGY Vol. 18 (1984), pgs. 909-916.

[7] Environmental Protection Agency, "40 CFR Part 503; National Sewage Sludge Survey; Availability of Information and Data, and Anticipated Impacts on Proposed

Regulations; Proposed Rule," FEDERAL REGISTER November 9, 1990, pgs. 47210-47283.

[8] The "Part 503" sewage sludge regulations are available on diskette from the National Technical Information Service [NTIS]; telephone 1-800-553-6847; purchase item No. PB93-500478INC; price: $60.00.

[9] Charles G. Manos and others, "Prevalence of Asbestos in Sewage Sludges From 51 Large and Small Cities in the United States," CHEMOSPHERE Vol. 22, Nos. 9-10 (1991), pgs. 963-967.

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[14] Ed Haag, "Just Say No," DAIRY TODAY (March 1992), pgs. 82-83.

[15] S.R. Smith, "Effect of Soil pH on Availability to Crops of Metals in Sewage Sludge-Treated Soils. II. Cadmium Uptake by Crops and Implications for Human Dietary Intake," ENVIRONMENTAL POLLUTION Vol. 86 (1994), pgs. 5-13.

[16] Sara Brallier and others, "Liming Effects on Availability of Cd, Cu, Ni, and Zn in a Soil Amended with Sewage Sludge 16 Years Previously," WATER, AIR AND SOIL POLLUTION Vol. 86 (1996), pgs. 195-206.

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Environment," JOURNAL OF ENVIRONMENTAL QUALITY Vol. 26 (March-April 1997), pgs. 551-557.

[18] Brian J. Alloway and Andrew P. Jackson, "The Behaviour of Heavy Metals in Sewage Sludge-Amended Soils," THE SCIENCE OF THE TOTAL ENVIRONMENT Vol. 100 (1991), pgs. 151-176.

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[32] "EPA and Stakeholders Outline New Biosolids Management Approaches," BIOCYCLE (August 1995), pg. 6.

[33] Robert Goodland and Abby Rockefeller, "What is Environmental Sustainability in Sanitation?" IETC'S INSIGHT [newsletter of the United Nations Environment Programme, International Environmental Technology Centre] Summer, 1996), pgs. 5-8. The International Environmental Technology Centre can be reached at: UNEP-IETC, 2-1110 Ryokuchikoen, Tsurumi-ku, Osaka 538, Japan. Telephone:

(81-6) 915-4580; fax: (81-6) 915-0304; E-mail: cstrohma@unep.or.jp; URL: http://www.unep.or.jp/.

Descriptor terms: sewage sludge; clean ocean action; cindy zipf; epa; pcbs; dioxin; asbestos; bioaccumulation; wildlife; forests; birds; mammals; agriculture; farming; farm land; soil; dimethylnitrosamine; dioxin; pesticides; nutrients; mutagens; carcinogens; arsenic; cadmium; chromium; copper; lead; mercury; molybdenum; nickel; selenium; zinc; acid rain; acid precipitation; livestock; regulation; regulations; beef; cow's milk;

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--Peter Montague, Editor

Attachment T


# N. H. Municipal Association

**PO Box 617, Concord, NH 03302 ▪ (603) 224-7447**


## TESTIMONY ON SB 218-FN-LOCAL

*Senate Environment Committee*
*April 1, 1999*

My name is Judy Silva and I am Associate Legal Counsel for the New Hampshire Municipal Association (NHMA). I appear today in **STRONG OPPOSITION** to **SB 218-FN-L**.

NHMA has a standing sludge/biosolids policy, adopted by membership, which governs our position on sludge/biosolids legislation. The policy states as follows:

> **NHMA SUPPORTS** reliable enforcement of scientifically based health and environmental standards for the land spreading of sludge/biosolids; **OPPOSES** any state legislation which would curtail the ability of NH communities to dispose of their municipal sludge through land spreading, when done in accord with such scientifically-based standards; and **OPPOSES** any preemption of local authority to regulate this field.

As the Department of Environmental Services and the New Hampshire Water Pollution Control Association have both identified, SB 218 is essentially a ***ban*** on the land application of sludge, due to the increased cost of sludge analysis, additional site and setback restrictions, and additional site management constraints. The only option remaining would be to landfill sludge, which carries a huge price tag. The fiscal impact on municipalities is estimated to be an increase in local expenditures of $1,160,800 in FY 2000, $1,280,900 in FY 2001, $1,219,400 in FY 2002, and $1,345,500 in FY 2001. Costs will increase not only for those communities with waste water treatment plants, but for all communities which bring their sludge or septage to those plants. These increased costs are due to the need to landfill sludge which is now being land applied and are contrary to Part 1, Art. 28-a of the New Hampshire Constitution.

The bill deals with many of the same issues addressed in the sludge rules, only in a conflicting manner. These rules are the product of months of study and negotiation by both sides of the sludge debate. I want to take this opportunity to again commend DES staff for the time they spent meeting with local waste water treatment folks and listening to their concerns and incorporating those concerns into the rules. While we don't agree with everything in the rules, they need to be put into operation and allowed to work.

I would like to specifically address the proposed new statute RSA 485-A:5-h, on page 4 line 32, which would prohibit a municipality with a wastewater treatment plant from excluding communities with local sludge regulations from using the facility. This provision ***preempts*** the authority of a municipality with a wastewater treatment plant to decide not to deal with communities which ban land application and falls squarely within our policy to ***oppose preemption of local authority to regulate in this field***. It is state interference with how municipalities conduct their local business and is a bad idea for several reasons.

Wastewater treatment facilities generate sludge or biosolids which have to be disposed of in some fashion, and you have heard from state and local officials that land application is the most cost effective way to dispose of those biosolids. Many municipal wastewater treatment facilities take sludge or septage from outside community borders. Some wastewater treatment facilities have adopted rules that say they will not accept septage from any municipality which has banned the land application of biosolids. They do this to make sure that those communities with wastewater treatment plants are not the only ones with the responsibility to find something to do with the resulting biosolids—so that those communities with facilities are not left "holding the bag." These are decisions that should be *left at the local level.*

Instead of helping municipalities without treatment plants, this bill has the potential to cause harm to those municipalities. RSA 485-A:5-b requires each municipality to provide or assure access to a septage facility for its residents. DES is currently working to enforce this requirement, and we support their approach—which has been educational not punitive—and will be working with them. If this bill passes with this language, you will most likely find communities with wastewater treatment plants refusing to deal with ***any*** other communities, whether they ban landspreading or not. That will be harmful to municipalities that are trying to comply with the septage planning requirements of RSA 485-A:5-b and it will not further the statewide effort to obtain compliance with this statute. Will we then be back here in a year or two on a bill which would require wastewater treatment facilities to accept septage from outside their borders?

The operation of wastewater treatment facilities is a ***local control*** issue. Left alone, without state intervention, municipalities with and without wastewater treatment plants will find the proper balance for dealing with their sludge and septage responsibilities. This provision can only make things worse, not better.

Because this bill would—in effect—ban landspreading, because it would increase costs significantly for municipalities, and because it would interfere with the *local* operation of *local* wastewater treatment facilities, we urge you to vote SB 218 **Inexpedient to Legislate**.

Attachment U

TOWN of HANOVER
HANOVER, NEW HAMPSHIRE 03755
P.O. BOX 483 603/643-4123

March 31, 1999

Members of the Senate Environment Committee
Room 104 Legislative Office Building
Concord, NH 03301

Dear Committee Members:

The Town of Hanover is very concerned about the restrictions and thresholds established for the land application of sludge in SB 218 and wishes to register its objection to the bill as currently proposed. Based on the current legislation, this bill would effectively eliminate the option of land application of Class B sludge by New Hampshire communities, including the sludge generated by the Hanover wastewater treatment plant. Currently, we send a portion of our sludge to a pilot composting facility, and contract for land application of the remaining portion. The Town has been engaged in land application of sludge for a number of years. We treat sewage generated by both Hanover and Lebanon customers, and treat septage from several neighboring communities.

The Town of Hanover currently generates 1,600 cubic yards of sludge per year. For FY1999-2000, the Town of Hanover has budgeted $54,400 for the disposal of sludge via a combination of composting and land application. Assuming the composting project is successful, we hope ultimately to compost 100% of our sludge. Were the composting pilot to prove financially or operationally infeasible for any reason, land application would be our only viable alternative. Were Hanover to be required to landfill its sludge based on the restrictions outlined in SB 218, the disposal cost per cubic yard would increase to $91.13 per wet ton (including trucking and tipping fees), for a total cost of $206,245. This represents a 300% increase over our current cost. Based on an annual operating budget of $1,027,374, it is anticipated that a requirement to landfill our sludge would result in a 23% increase in sewer rates.

More importantly, landfilling is simply not a viable long-term alternative for sludge disposal. Turnkey Landfill is the only option for many New Hampshire communities who choose to landfill sludge, and once it has reached its capacity, we will no longer have an option. To the extent we are required to landfill sludge, disposal capacity for other waste is reduced. Safe, carefully monitored land application of sludge, including Class B sludge, is possible and is happening throughout the region. The key to safe land application is not to adopt SB 218 as proposed, but rather to insure that DES is adequately staffed to effectively monitor the sludge regulations we have all worked so hard to review and put in place.

We urge the Committee members to address the impacts of SB 218 on communities like Hanover that generate Class B sludge. To eliminate the land application option for us is to effectively shut off an alternative that we have used carefully and successfully for many years.

Sincerely

Marilyn Black
Chairman
Hanover Board of Selectmen

cc: Board of Selectmen
Judy Silva, NHMA

May 6 1997

Attachment V

Mrs. Shirley Grilli
R.D. 1 Box 36
Pike N.H. 03780

New Hampshire State Senate
Senate Environment Committee
Concord, New Hampshire

Dear Senators:

I am writing to urge you to vote in favor of Senate Bill 218. I live in the town of Haverhill N.H. We do not have a large protected reservoir for drinking water. Instead we must rely on Town wells and springs, private wells, and the Ammonoosuc River. Residents are constantly concerned about contamination of this river. Causing further concern, the state recently advised the Town that the spring fed water in North Haverhill has not passed the N.H. DES standards. I assure you that the residents of Haverhill are very conscious of the need to protect the Town aquifers.

More than forty N.H. towns have now enacted sludge bans or regulations. It is a tremendous undertaking to get this type of regulation passed in any town, and it is even more remarkable to see that this is being accomplished through "grass roots" efforts. This tells us that the people are very concerned about the land application of sludge, and that they are not confident of current state regulations. These towns are not willing to take a chance with their health, their water, their property values, or the well being of area wildlife.

It was shocking to read that in October 1997 the National Wildlife Federation ranked New Hampshire among the country's worst violators of the federal Clean Water Act regulations. This news was further indication of the serious environmental problems that need to be addressed in our state.

Our aquifers provide an invaluable source of drinking water. We must stop allowing sludge to be land applied on these areas, and we must stop using sludge for gravel pit reclamation. It appears that our waters are already at risk and we should not delay in taking all necessary action to insure that we have safe water to drink and safe food to eat.

I have put together a packet for you which contains newspaper articles from twenty five towns that have been concerned with sludge application. I hope these articles will indicate the real concern of residents throughout the state.

The passage of Senate Bill 218 will be an important step towards protecting the soils and waters of New Hampshire. I urge you to support this bill.

Sincerely,
Shirley Grilli

THURSDAY, MARCH 13, 1997

The Citizen, Laconia, N.H.

# TOWN MEETING '97

# Alton Approves Ban on Sludge Spreading

By TROY L. MERRICK
Staff Writer

ALTON — Voters at Town Meeting approved a budget just 1.85 percent over last year's figures.

Residents also said yes to a number of capital improvement items and gave the green light to a petition seeking to ban sludge-spreading in town.

The total appropriated budget approved by voters after four hours of deliberation is $3,391,433, up from 1996-97's budget of $3,329,837. The budget figure includes capital reserve funds for the fire and highway departments, a $50,000 capital reserve fund for the Gilman Library addition, and a collective bargaining agreement reached between selectmen and state, county and municipal employees.

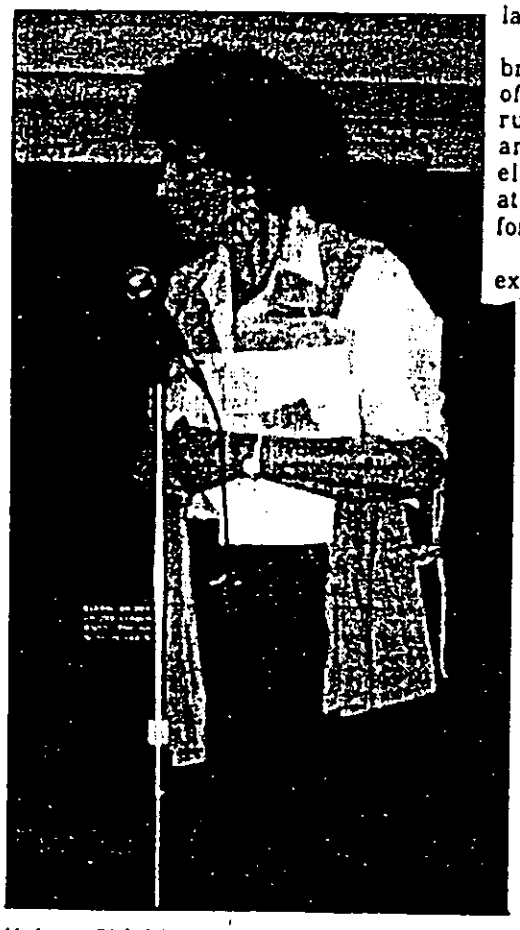
Between 200 and 250 voters came to the Alton Central School to decide 36 warrant articles, a crowd that dwindled as the hour edged past 10:30 p.m.

The general operating budget approved is $2,339,965, including an extra $25,000 requested for sand and plow blades by Road Agent Ken Roberts.

Town Administrator Scott Dunn said that he felt that the town's portion of the tax rate, presently at $4.15 per $1,000 of assessed property value, would not likely rise with this approved budget due to town growth. He felt that this year's meeting, although relatively sparsely attended, went well, and people with concerns were able to get their questions answered.

Helane Shields has been on the crusade against the land-spreading of sludge, claiming that New Hampshire has long been a "dumping ground" for sludge, or biosolids/recycled sewage. She has drawn intense criticism from wastewater treatment officials and others for her claims that such material is harmful to the public.

Nevertheless, voters Wednesday night overwhelmingly approved Shields' request to have the practice banned in Alton. Included would be Class B biosolids relating to sewage, paper and pulp sludge.



Helane Shields discusses her reasons why Alton should ban land application of treated sewage. (Citizen Photo/Troy L. Merrick)

"A lot of people don't realize that New Hampshire is becoming the sludge capital of New England," she said, having successfully amended the warrant to get her petitioned article, which would have been dealt with last, to the beginning of the night's busines

She cited a number of sludge haulers th bring sludge into New Hampshire from ou of-state and chided the Granite State's wea rules and regulations against that. Sh amended the original petition, however, t eliminate confusion about whether he attempt was to stop Alton's use of its lagoor for storing its wastewater.

"That was never the reason," sh explained.

ALTON PROTECTS WINNIPESAUKEE WATERSHED BY BANNING SLUDGE DUMPING.

Alton

# Sludge: Barnstead couple fights to have it banned

By RAY CARBONE
Lakes Region Bureau Chief

BARNSTEAD — Diane St. Germain may not be able to smell anything, but she thinks the 600 tons of bio-solids sitting on farmland on John Tasker Road stinks.

More to the point, the 15-year resident worries the bio-solids may be dangerous to people's health.

But a local farmer using the material says calls it terrific fertilizer for his hay fields.

Continued from Page 11A

The material — composed of pretreated sewage of both residential and industrial waste — is now laying in piles covered with wood ash, according to St. Germain, until the spring when it will be used as fertilizer.

"I think the wood ash is to cover the odor, but Class A compost isn't supposed to smell," St. Germain said.

No spokesman for BFI, which produced the material, was available for comment.

St. Germain says that the material on John Tasker Road comes from a wastewater operation in Springfield, Mass., and she claims it contains large amounts of harmful industrial wastes that will not break up in the soil.

Selectman John Cotton reportedly told St. Germain that the bio-solids were Class A and therefore were not restricted in their use in town.

Until recently, New Hampshire was the only state in the country to have no restrictions on sludge use, White said. Even now, with regulations from the Environmental Protection Agency requiring companies to have a state-approved plan and communications with communities where sludge-spreading may occur, Barnstead is left out.

Resident Brian White is also concerned.

"I don't like the idea of all this stuff coming in here," White said. "To me it seems like a way for industry to dispose of their toxic waste."

"They're laying it all over the state," he added. "And this stuff doesn't go away. And we're stuck in it."

St. Germain's interest in the use of bio-solids as fertilizer began more than a year ago, after she listened to a radio program debating the issue.

After investigating it further, she took part with White in an effort to ban the use of bio-solids in Barnstead last year. The proposal was defeated at the Town Meeting in March. St. Germain and others now have a zoning proposal to restrict bio-solids use on this year's election warrant.

LeRoy Stewart, who is using the sludge to help his hay-growing on the Tasker Road property, has used the material before and doesn't know why St. Germain and White are nervous about the potential hazard.

"I don't see it," he said. "If we don't use it, it would have to go into a landfill where it will take a lot longer to break up. Here the worms work into it and turn it into top soil. I can't see they'd be any danger in it."

The sludge also helps his hay grow, he said.

"It brings the productivity way up," commented Stewart. "I wouldn't be in business without it, because I can't afford fertilizer."

And there are limitations on where he can spread his sludge, he added.

"There are lots of regulations," said Stewart. "It has to be so many feet from wells, streams and all that. You can't use it in a field with too much slope, where there could be run-off."

Fred Goodrich, who owns one of the farm Stewart is using, sees it the same way.

"The first year LeRoy did it, he went from 120 bales to 360 bales of hay on eight or nine acres," Goodrich said.

In fact, Goodrich can help but chuckle at the controversy.

"I'm just amazed," he said. "These people come from the city who don't realize that you have to fertilize fields, that's all I can figure. It seems people have to get upset about something."

12A Foster's Sunday Citizen, February 22, 1998

Barnstead

Barnstead

# Letters to the Editor

## Sludge alert

At a meeting at the Littleton Opera House last week, attended by two members of AWARE, Browning Ferns Industries (BFI), the giant waste industry, announced to an otherwise empty house that its division, BFI Organics, would be dumping what they call "biosolids" from Littleton's waste treatment plant, including hospital waste, on a parcel of Littleton land, this time mixed with solid residue from the CPM Inc. papermaker in Vermont. The brochures handed out at the meeting by company representatives unashamedly define "biosolids" as "nutrient rich organic material resulting from the treatment of wastewater," sometimes in the doublespeak of the industry referred to as a "land amendment" that can be beneficially used in place of commercial fertilizer. Mixed with short paper fiber, BFI claims the product can be used in all cases where topsoil is needed such as roadside work, daily landfill cover, and reportedly recently applied by the Casella brothers to close the old Prospect St. dump in Bethlehem. But to the scientific community it's all "toxic sludge." (See "Toxic Sludge is Good for You: Damn Lies and the Public Relations Industry" to which this letter liberally refers.)

The Harper Collins *Dictionary of Environmental Science* defines sludge as a "viscous, semisolid mixture of bacteria and virus laden organic matter, toxic metals, synthetic organic chemicals and settled solids removed from domestic and industrial waste water at a sewage treatment plant" that contains over 60,000 toxic substances and chemical compounds... According to Dr. Stanley Tackett, an expert on lead contamination, due to the nature of the treatment process, all sewage sludge contains elevated levels of lead which is a highly toxic and cumulative poison.

A team of researchers at the University of Arizona in 1992 found that "significant numbers" of dangerous human disease organisms infect even treated sludge. The viruses, bacteria, protozoa, fungi and intestinal worms present in sewage and sludge is mindboggling and defines the capabilities of science. Many of the pathogens cause diseases that sicken, cripple and kill humans including salmonella, shigella, campylobacter, e-coli, enteroviruses (which cause paralysis, meningitis, fever, respiratory illness, diarrhea, encephalatis, giardia, cryptosporidium, roundworm, hookworm and tapeworm.

Sludge pathogens can move through many environmental pathways--direct contact with sludge, evaporation and inhalation, contaminated groundwater, contamination of rodents burrowing in sludge, and uptake through the roots of crops. According to Dr. Tackett, land spreading program for sewage sludge is a scam of enormous proportions, driven mainly by money, he charges. The high sounding justifications such as "sludge is a beneficial resource" and "sludge is just as safe as manure" are clever excuses designed to fool the public....

In truth, only one of three percent of the sludge is useful to plants. The other 97 to 99 percent is contaminated waste that should not be spread where people live. Land spreading of sewage sludge is not a true "disposal" method, but rather serves only to transfer the pollutants in the sludge from the treatment plant to the soil, air and ground water of the disposal site.

Little known is the fact that until very recently, New Hampshire has been totally unregulated, turning the state into a dumping ground for the rest of the region, with half the sludge in the state coming from Massachusetts, Vermont and Maine in "tidal wave proportions resulting in hundreds of farms gravel pits and other sites where 25-ton loads of sludge are regularly spread or stored," according to the *Boston Globe*.

But not to worry: Help is on the way. The state Department of Environmental Services has convened an advisory committee on sludge, with BFI Organics a prominent member on the committee. In addition, University for New Hampshire scientists are applying sludge and manure and comparing the two samples. The UNH scientists received $5,000 from BFI for their work. In the meantime, Selina Mikofsky, of the state Department of Environmental Safety, in a masterpiece of scientific understatement and managerial decisiveness, has reassuringly announced, "There are no known health hazards and it has to go somewhere." Bethlehem,

(Continued on Five)

# More letters

(Continued from Four)

Littleton, Twin Mountain, Whitefield?

Many letters have been sent to the editor of *The Courier* expressing concern about the threat by oil companies to Alaska's indigenous peoples, wildlife and terrain. AWARE shares the concern of those letter writers and urges them to also turn their attention to the problems close at hand. The BFIs of the world are driven by greed and are not ashamed of the harm they cause. Do we care enough to let them know that if they want to make money in the waste disposal business, they must develop methods that do not harm communities. How many owners or shareholders of these industries are willing to eat the poisoned crops from their fields or live next to the nauseating smell and toxic environment they create with their dumps?

Dr George Manupelli

Bethlehem AWARE

Bethlehem

# Brentwood warned about sludge fertilizer

**By Steve Jusseaume**
RCN Correspondent

BRENTWOOD — Charlie Reid offered Brentwood selectmen and a room full of residents a treatise on sludge Tuesday evening that had even the most ardent supporter of biosolids-as-fertilizer shaking his head afterwards.

Reid, a Nottingham resident, and allied with NOFA-NH, a non-profit group of New Hampshire consumers, spoke before the board at the invitation of Phil Barry, a Rowell Road resident who requested the hearing so that Brentwood residents might understand just what they approved at the polls in March.

A planning board-sponsored zoning amendment regulating biosolids brought into town by outside contractors passed in March by a better than three-to-one margin.

Barry, however, said that the amendment didn't go far enough, and voters were not fully aware of the potential health hazards that sludge can cause.

By way of introduction, Barry referred to biosolids as a nifty public relations moniker for what the stuff really is: human and industrial waste that is contaminated with heavy metals that can cause everything from just a bad smell to death in animals and in humans.

Reid emphasized the same point. Human waste alone would be fine. The problem comes from industries that discharge chemicals into sewer treatment plants, Reid said. "Industry is cutting corners... and discharging chemicals into sewerage systems that find their way into treatment plants, and into sludge."

Reid noted that in 1993 the Environmental Protection Agency relaxed its standards regarding allowable heavy metals that can be spread as biosolids, or sludge, onto farmers' pastures.

Allowable heavy metals in terms of pounds per acre include lead (from 111 pounds per acre before 1993 to 267 pounds per acres after 1993), mercury (13.4 to 50), arsenic (12.5 to 36), and zinc (151 to 2,493). "We've got a real serious problem with these levels," Reid said.

Reid further claimed that a University of New Hampshire study found more than 100 different viruses in sludge and over 60,000 different chemicals, including industrial solvents, DDT and pesticides.

A Tulane University study further identified chemicals such as chlodane, PCBs, toxaphene and dioxin in samples of sludge.

Dioxin, Reid said, is a component of Agent Orange, the defoliant used in the Vietnam War. He added that a study conducted in the Everglades found that PCBs, toxaphene and dioxin — called environmental estrogens as a group — caused alligators to lay eggs that hatched exclusively female young.

Dioxin, Reid stressed, is more common in the environment than many people think. It is produced by ordinary procedures such as the incineration of chlorine products and PCV piping, as well as in the bleaching process in making paper.

Answering questions posed by those in attendance, Reid said that regulations in Europe regarding heavy metals are much stricter than in the United States, as much as 95 percent tighter, he said.

Brentwood resident Bill Vahey, however, defended the town's biosolids zoning ordinance. "I think the planning board deserves a lot of credit for what they've done. They have stopped uncontrolled sludge from coming into town," Vahey said.

Brentwood Planning Board member Bruce Stevens added that the town's ordinance exceeds New Hampshire and EPA guidelines. He said, however, "a procedure is in place to change any ordinance in town, if the people want to change it."

Exeter News Letter
May 2, 1997

Brentwood

# Abutters Confront Town On Biosolids Stockpile

## Bristol Officials Meet with 30 Residents

LACONIA EVENING CITIZEN
SEPT. 13, 1996

Bristol

By ROBERT M. COOK
Newfound Area Bureau

BRISTOL — Facing an angry group of 30 abutters who live next to a field where 182 tons of treated sludge will be spread, selectmen say they never checked to see if the firm removed the sludge as ordered by the town a year ago and did not know it had been stockpiled for a year until last week.

"We were not aware as a Board of Selectmen that it was not all removed," said Selectman Mike Bannan to the residents who attended a special meeting Thursday at the Bristol Town Office Building. "We just thought it was removed."

Bannan explained that after the selectmen received complaints last summer of odors from the 1,000 tons of treated sludge trucked in by BFI Organices of Northfield and mixed with lime at a sand pit owned by J.P. Morrison Sr., the selectmen enforced a town ordinance that prohibits such odors.

In a letter dated Sept. 6, 1995 to

BRISTOL, Page 10

● BRISTOL
☐ FROM PAGE 1 ☐

BFI Organics, former Town Administrator William McChesney wrote that BFI Organics was ordered to remove all the treated sludge at the site when he wrote, "You are hereby notified to cease that activity immediately and remove sludge stored at the site."

Bannan said the selectmen learned last week from BFI Organics that only the treated sludge mixed with lime that gave off the odors violating the town ordinance was removed. The remaining 182 tons of treated sludge mixed with wood ash from the Ryegate (Vt.) Power Company continued to be stored there.

Gregg Burwell asked the selectmen if they ever checked to see if the firm had carried out their order to remove all the treated sludge, and he was told town officials never did.

"It was our intention to have that sludge removed last year. We were under the assumption it was removed," said Bannan.

He said the reason the selectmen never saw fit to make sure the company carried out their order to the letter was because the remaining sludge did not carry any odors or result in any more complaints from residents. Without odors present, the board also did not see fit to fine the landowner the daily $100 fine, according to Bannan.

Selectman Jeffrey Shackett told the abutters and residents that the board sent BFI Organics a letter last week after the company held a public informational meeting telling them to closely monitor the land application operation and to cease carrying it out if any odors were present.

Shackett stressed that enforcing the town's ordinance is the only authority the selectmen have to control the land application project that involves 300 cubic yards of treated sludge from the Nashua Wastewater Treatment Plant that will be spread on 13 acres of Morrison's hay field.

"We can't do anything unless it smells," Shackett said.

Town Administrator Dexter Bucklin said he visited the site Thursday afternoon and did not detect any traces of odors which some residents said smell like a dead animal carcass.

Bannan told residents that he does not have any problems with the application of treated sludge in town as long as it does not carry any odors. He said the material in question has to meet strict federal Environmental Protection Agency and state Department of Environmental Services standards before it can even be taken to any community.

Residents said they had little faith in those government standards and said they are concerned the material may contain harmful agents that could pose health risks and contaminate the ground water supply. The field is located next to the Pemigewasset River.

Throughout the four-hour meeting, Selectman J.P. Morrison Jr. sat in the audience and listened to what was said. His father owns the field in question, and he cannot participate in the discussion or vote on any matters pertaining to it without causing a conflict of interest.

Several abutters and residents asked the board what they would have to do in order to get the issue of treated sludge before voters to let them decide whether it should be allowed in Bristol.

Other residents like Bob Curdie asked selectmen why the town did not take the lead on this issue and present an ordinance before voters at Town Meeting last March to ban treated sludge in Bristol outright. Curdie also questioned the board's reluctance to enforce the existing odors ordinance in J.P. Morrison Sr.'s case.

"Why are we placating certain people and dragging our feet on this thing?" Curdie asked Bannan and Shackett.

In response to Curdie's comment and other comments made that sought to show how much influence J.P. Morrison Sr. allegedly has with the selectmen, Bannan said, "It is not my intention and I hope it is not your intention to punish Mr. Morrison if there is no smell coming from down there."

Bannan said that because no one came forward with such a proposed treated sludge ban ordinance for the selectmen or the town to consider earlier this year, the board did not believe it was their responsibility to pursue such an ordinance.

"It is not necessarily up to the selectmen to draw up an ordinance," Bannan said.

When asked if the town could hold a special town meeting to decide whether to allow treated sludge land applications, Bannan said it would very difficult to hold one and expensive for the town

Bucklin said that if they presented a petition with at least 25 signatures from registered voters calling for an article to be placed on the Annual Town Meeting warrant in March, the issue would go before voters.

Donna Norris, owner of the Fox Meadow Retirement Home on Route 104, which is located directly across the road from the field, collected 243 signatures from abutters and residents across town calling for the selectmen to enforce the town's odor ordinance immediately to stop the spreading project from taking place. Norris presented her petition to the selectmen after the public hearing ended around 10 p.m.

Norris said at least four abutters who live on Nyberg Road were never notified by BFI Organics as required by the new DES regulations about the first public hearing and its plan to spread the treated sludge. She said that in itself constitutes a violation that could stop the project.

10451NEL

CARROLL COUNTY INDEPENDENT Carroll Co. Ledger
N.H. JUNE 4, 1997 Wed. June 4, 1997

Effingham



# Proposal would ban Class B sludge, enact permit system

By NATALIE PETERSON

EFFINGHAM — While a petition for another special town meeting took up much of the May 29 selectmen's meeting, other matters were addressed, also.

• Selectmen Chairman Donald LaChance has proposed a sludge ordinance that would ban all use of Class B sludge in Effingham, but would permit some applications of Class A sludge, which he defined as "treated and less toxic," and "not industrial waste."

"This is a very, very emotional and hot issue," LaChance said, calling his proposal "an effort to strike a middle ground." He said he also would suggest a permitting system be enacted so that selectmen would have some control over the use of Class A sludge.

The permit application would include information about the origin of the sludge, where and how much is to be spread, and other details that would help selectmen assure the protection of water resources and the public's health and safety.

Another proposal would require the land owner to stipulate that the sludge does not contain dioxin or other heavy metals and that the ph level does not exceed a certain standard.

Discussion of the sludge issue drew some support for town officials to explore ways in which the town can responsibly dispose of its own septage. "It's only a matter of time. We're going to have to take care of our own," said Selectman Christopher Seamans.

Among the options mentioned were contracting with Ossipee, building a septage lagoon in Effingham and working toward a regional solution.

A public hearing on the new sludge proposal will be scheduled.

• Selectmen received a letter, signed by 22 Effingham residents, complaining about the condition of land in Taylor City, owned by Lawrence Edwards. The letter complained of potential health and safety hazards because of an overflowing dumpster, garbage bags, discarded refrigerators and other debris on the site.

The letter expressed concerns about a visiting bear; the attraction of rats and other animals, given the widespread rabies epidemic; a potential for groundwater contamination; and the recurring illnesses of an abutter's dog.

Edwards, who was present at the meeting, explained that the dumpster is regularly emptied by a contractor and taken to a waste disposal facility in Rochester. He said he calls to have the white metals picked up as necessary.

"Are you running a transfer station?" asked LaChance.

Edwards offered to meet the selectmen on site to walk the property with them and try to resolve any problems.

Dorothy Monaghan said she is concerned about other properties as well, but questioned what town officials can do without zoning ordinances.

LaChance said the selectmen serve as the town's health officers and can act in that capacity if there are public health and safety issues involved. He asked that she submit her concerns in writing.

• Selectmen received a petition, signed by 16 Effingham voters, asking for a special town meeting to act on the following:

"Shall we modify the elderly exemptions from property tax in the town of Effingham, based on assessed value, for qualified taxpayers, to be as follows: for a person 65 years of age up to 75 years, $10,000; for a person 75 years up to 80 years, $15,000; for a person 80 years of age or older, $20,000. To qualify, the person must have been a New Hampshire resident for at least five years, own the real estate individually or jointly, or if the real estate is owned by such person's spouse, they must have been married for at least five years. In addition, the taxpayer must have a net income of not more than $15,500, or, if married, a combined net income of not more than $23,500; and own assets not in excess of $35,000 excluding the value of the person's residence."

The request is under consideration.

• The town's planning board received both criticism and praise at the May 29 selectmen's meeting.

Johnathan Meisner wanted to know why, "all of a sudden," the board is interested in revising the Master Plan when it hasn't been of concern for the past 10-11 years. "And what's been accomplished in the last four years?" he asked.

Planning Board Chairman Gary Jewell said that the plan is supposed to be revised every 5-10 years, that the town needs regulations it can uphold, and that it must be done prior to adoption of zoning ordinances.

On a more positive note, Charles Drew, publicly commended members of the planning board for "Keeping their cool" in the face of "rude comments — some pretty rank — from a small group" of people at the recent special town meeting.

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Effingham

Remont

# remont Balks at Thought of Sludge

## ry Farmer Wants To Use It for Fertilizer; Idea Raises Health Concerns

Y J. VELLUCCI
nader Correspondent

MONT — Planners are expected to his month with a local dairy farmer and erhill, Mass., businessman in an at- to answer questions about the duo's to use sludge as fertilizer on a farm

Peterson had Browning-Ferris Indus- ransport the material to Fremont last om the wastewater treatment plant in l, Mass. He planned to spread it on his n Martin Road, a procedure that is al- le under the law and regulated by the l Environmental Protection Agency.

al planners, however, said they are wor- ıe substance could be harmful.

posture is it's unsafe until proven oth- ," said planning board chairman Brian . Upon request, BFI removed the bioso- om the land.

planning board has scheduled a meet- 9 p.m. next Tuesday with Peterson and Busa, who works at Stewart Septic in hill, Mass.

mont is the second town to become em- d in a controversy over sludge spread- cently.

rdy's concerns have been echoed by Au- residents, who have complained about ır McConnachie's spreading of the ma- terial from two Massachusetts wastewater treatment plants, in Lynn and Athol.

After an Auburn health officer's sample of the sludge revealed high coliform bacteria counts, a Superior Court judge in Rockingham County ordered McConnachie's operation temporarily shut down. A Feb. 7 court hearing has been scheduled.

Hardy said he understands what Auburn officials are going through. He believes the Fremont board will need to conduct a site plan review because of the change of use at the farm and because of the potential environmental effect.

Mostly, he fears the accumulation of metals in the ground could concentrate in the grass and contaminate the milk Peterson sells, he said. Planners also want to make sure the pristine Piscassic River, which runs through the property, doesn't become tainted, he said.

Busa, originally a subcontractor for BFI, has entered into a lease agreement with Peterson for hauling the material. He intends to discuss at the Fremont meeting a land management plan for application of the sludge.

Jeff Edelstein, a district organics manager with BFI's Portsmouth office, said BFI has since severed ties with Busa.

In October, Edelstein said Busa didn't handle the situation properly in having failed to notify Fremont officials. Although Edelstein had hoped BFI would take over the le from Busa and work directly with Peter: Busa would not agree to that, he said.

"This farmer is locked in now," said E stein, explaining that Peterson likely have to honor the five-year lease with B That document also gives Busa the righ renew for two additional five-year peri making a total of 15 years.

Still, Edelstein and representatives of EPA said the recycling of sludge, the product of human waste, is perfectly acc able and perfectly safe.

If this substitute for commercial nitro fertilizer is not considered clean, it can' used in any land application program, Edelstein.

EPA representatives have questioned Auburn coliform counts, saying proper cedure for the sampling and testing may have been followed. Auburn officials they stand by the test.

Last week, Susan Nachmann, a compli engineer with EPA, inspected McConnac farm at 6 Silver Hill Road in Auburn. determined he was following the law.

The public is invited to the Fremont i national meeting at Town Hall on Jan. 18

Auburn officials will discuss the issue p.m. Wednesday in Town Hall.

## *Here comes the sludge*

2-22-95

To the editor:

Another damned public hearing! Of all the stupid and archaic ideas, the state of New Hampshire is giving a permit to an individual which allows him to deposit untreated and under-treated human waste on the surface of the land in Lancaster. Human waste includes not only feces and urine which harbor salmonella, hepatitis and others of this ilk, but all of the other materials that find their way into our toilets.

Under this permit, the contents of septic tanks would be pumped and spread on the fields of Lancaster. Septic tanks aptly named, are by definition tanks of putrid matter in a septic condition. That is, material that is in a toxic condition resulting from the spread of bacteria and their products in an infestation ... Yuk!

Waste, even from residential homes is usually contaminated with heavy metals, residuals from pesticides (dioxin, et. al.), harsh chemicals such as drain cleaners (including those that kill the biological fauna of waste systems, resulting in septic tanks needing to be pumped), and "new" chemicals that have been formed in septic tanks through reactions that have synergised household chemicals into unpredictable combinations. An example of the results of an unpredictable combination would be blowing your head off by mixing toilet bowl cleaners, but an explosion is only one of many types of reactions and products that occur.

Human waste should never be used as "sludge" in land spreading. Extensive studies conclude that spreading human waste as sludge is not a safe practice. Though I recognize the problem of waste disposal is severe and that our current methodology is archaic and leads to ecological problems, the proposed spreading of sludge in Lancaster does nothing to alleviate these problems. In fact, the activities outlined in this proposal offer an increased health risk to the residents of Lancaster. This increased health risk is in no way related to activities that can be shown to be mitigated by public gain. There are too many ambiguities and documented threats to public health and the future health of this community to allow sludge spreading.

Rejection and denial of these permits is the only acceptable action for the state. This will not happen without your voicing your objection at the public hearing in the Town Hall on February 23, at 7 p.m. Or, we can just wait for others to allow this to occur and later join groups like Help For Sewage Victims in Vermont. We could even become the topic of such ever-popular journals as *Morbidity and Mortality*. (See: Vol. 401 No. 321. Aug. 16, 1991 for an example of a community that allowed this spreading of septage.

Excrement, plastic applicators, condoms, drain cleaners, and heavy metals have no place in land spreading. Demand the rejection and denial of these permits.

Sincerely,
Jeff Elliott
Lancaster

FREMONT

Fremont

Union Leader Nov 9 1998

# Sludge Near Meetinghouse

# Renews Gilmanton Debate

By ROGER AMSDEN
Union Leader Correspondent

GILMANTON — A load of sludge that had been dumped in a field near the historic Smith Meetinghouse last week was removed yesterday morning but the incident is expected to renew debate over the town's rules on sludge.

"It's not socially acceptable to spread sludge up here," said Russell Dubuc, a neighbor who contacted state and local officials about the sludge. He said it had a rank smell and was laced with feminine hygiene products and cigarette butts.

Dubuc said he met with selectmen and state officials about the sludge, which was spread with the approval of only one of the three Smith Meetinghouse trustees, former House Speaker George Roberts, and told them that it was too close to his land.

He said that when state officials toured the site Tuesday they agreed with his assessment, noting that the 35-foot-long pile had been placed too close to his boundary and was stored too close to a wetlands area.

It was removed from the site early yesterday morning by Biogro, a Portland, Maine, division of the Wheelabrator Company. The Class B sludge had come from a Lowell, Mass., waste treatment plant.

Dubuc said he fought the permit for spreading of the sludge two years ago and was upset that Roberts, who now works as a lobbyist in Concord, had signed the agreement with Biogro without consulting the other trustees.

Don Guarino, a Smith Meetinghouse trustee, said that neither he nor fellow trustee William Angevine signed the permit.

"I didn't know it was being deposited there," said Guarino, who said that there must have been some sort of misunderstanding on Roberts' part for him to have proceeded without the other trustees.

"He maintains the field and was going to use it for fertilizer. But when we looked at it we considered it unacceptable," said Guarino, who praised Roberts' efforts on behalf of restoring the historic meetinghouse.

Town officials are expecting that the incident will renew the debate that has been going on in this community for the last several years over the sludge issue.

Petitioners have tried in recent years to have the town adopt more stringent regulation of the spreading of biosolids. But town voters have favored relying on state and federal regulations.

David Russell, chairman of the board of selectmen, said he now anticipates another petition drive calling for stricter rules.

Gilmanton

# Fertilizer Initially Ruled

## Medical Examiner Awaits Lab, Toxicology Test

By JERRY MILLER
Union Leader Correspondent

GREENLAND — A 26-year-old man's death Friday has raised concerns about the role of a fertilizer which had been spread a month ago near the man's home.

Shayne Conner, 26, died in his sleep Friday.

Conner lived off Turtle Lane, near a privately owned field, where a fertilizer, made of biosolids, had been spread.

While neighbors complained the fertilizer gave off foul odors since it was applied, New Hampshire Medical Examiner Dr. James Kaplan said yesterday initial autopsy results indicate Conner's death was not linked to the fertilizer.

"I don't see any connection. In my view, there is no scientific basis for a concern that the material might be connected to Mr. Conner's death," said Kaplan.

A final determination of the cause of death will be made following completion of microscopic and toxicology studies, according to Kaplan.

A spokesman for Wheelabrator Systems of Hampton, whose Anapolis, Md., subsidiary, Bio Gro, manufactured the fertilizer, said yesterday there has never been a medically documented case of bio-solids leading to adverse health effects in humans.

"There is no link between the fertilizer application process to this weekend's tragedy," said Cynthia Wheeler.

Wheeler continued to insist the only byproduct of the fertilizer is the temporary odor.

When asked to describe the smell, Wheeler said, "I haven't been out there."

However, Wheeler did say the company delivered and spread 22 dump-truck loads of the fertilizer on the 38-acre site.

Wheeler said biosolids, from which the fertilizer is made, are what remains after municipal sewage-treatment plants treat water and human waste. Lime or other high-alkaline material are then added to the compound.

The spokesperson said the property owner had the fertilizer spread on a field used to grow hay.

The odors produced by the fertilizer led residents and town officials to demand a meeting with Wheelabrator and Bio Gro officials.

# Out in Death

## Results Before Final Decision

***"I don't see any connection. In my view, there is no scientific basis for a concern that the material might be connected to Mr. Conner's death."***

— Dr. James Kaplan, State medical examiner

Greenland

# Septage-Spreading Plan Scheduled For Hearing

Groveton

By PETER RIVIERE

A public hearing scheduled for Feb. 23. on land-spreading septage has some noses out of joint both here and in Groveton.

The plan by David Rexford, to spread up to 100,000 gallons of septage a month on a 10-acre plot north of the fairgrounds (the former Morin potato barn plot) will be aired. Celina Macofsky of the state's Water Quality Permits and Compliance office will be present to explain the process, take concerns and make a determination on the permit.

Rexford must follow U.S. Environmental Protection Agency and state guidelines that limit dumping to the months of May to October, prohibit rainy day dumping and require that the ph of any septage be at a minimum 12 in order to kill germs, viruses and presumably odor.

Presently Rexford pays $80 per 1,000 gallons to dump at the town's sewerage treatment plant, and that privilege is limited by successive days of cloudy or rainy weather.

Rexford said being able to landfill a load as he receives it will provide more convenience and be easier on the town.

According to Peter Kulbacki, the public works coordinator for Lancaster, adding septage to the treatment plant and lagoons is a shock to the precarious operating balance and can easily knock that balance out of whack causing discharge rates that do not meet stringent EPA standards.

Macofski said towns are directed to find alternative septage dumping areas. Only about 25 sites are approved in the state to date.

"Septage spreading is not really new," she said from her office in Concord, "it's just getting more publicity."

Macofski describes the process Rexford will follow from backyard septic tank to field spreading as "a pretty simple process."

Rexford first will test the material in the home tank for pH level, which will tell him how much lime he must add to his tank. He will then pump into his mobile tank, add lime to raise the pH, wait 30 minutes and test again.

If the numbers are right, he will be free to spread the septage at the rate of 38,000 gallons per acre for cow corn (corn silage) and 77,000 gallons per acre for hayfields. Rexford's 100,000 gallons per month rate over the spreading period averages to about 60,000 gallons per acre.

Rexford says he must keep records for five years and could allow other pumpers to use his property to dump but "wants to know for sure what's going onto the property."

Currently when Rexford does not take septage to the town lagoons, he trucks it to the John Huckins farm in Groveton.

Huckins tanks and treats the loads and then land tills/injects the material on his fields off the Brown Road.

Some Groveton residents have petitioned to stop the practice of land-spreading human waste in town, some because they claim it smells, and others out of fear that land-spreading will contaminate the town's new water source in meadows down from the Huckins spreading area.

They are upset, too, that no public hearing was required in Groveton as will be the case in Lancaster.

But it is Kulbacki who asked the state to conduct the hearing because he fears compliance will fall to him if a permit is granted to Rexford and there are subsequent problems.

"The problem is there are no teeth in the compliance regulations," said Kulbacki, adding that prevention is better than an after-the-fact cure.

Rexford countered that Kulbacki is not giving anyone credit for doing things right and letting things work.

## Disgusting Smell Must Stop

To the Editors: Do you live in this area? Do you work in this area? Do you drive through this area? If you have answered yes to any of these questions you have experienced life's most discusting event. You have smelled the odor of human waste coming from Manchester's waste water plant off Brown Avenue.

Millions and millions of dollars have been spent at our expense and the smell is still disgusting and prevalent, and I want you to know that the odor you are smelling is from all forms of human waste. Think about that for a moment. No wait! Think about that for a long time. You are inhaling the smell of human waste and this smell is going right into your lungs - your very precious lungs.

We have to stop this disgusting smell. Covers have to be installed over the offending areas before "anything" else is done at this plant. I urge you to call Sen. Robert Smith at 1-800-922-2230 and tell him how bad it is and give him your location. He is fully aware of the problem and he can help us. Do you want to smell human waste forever?

COLIN WERNER

P.O. Box 5423
Manchester 03108

3427

HAVERHILL



# Sludge spreaders are promoting sludge disposal schemes

Dear Editor,
Sludge: A Dangerous Trojan Horse

Haverhill and Benton are among a number of New Hampshire towns that are considering a sludge related warrant article this year. The first logical question is "What is Sludge"? A Cornell University publication on integrated field crop management describes sludge as follows:

"Sewage sludges are a by-product of sewage treatment and contain not only nutrients and organic matter but also contaminants such as metals and toxic organics discharged into the sewers from industries and businesses and leached pipes."

Sludge is, essentially, that which is disposed of by households, businesses and industries into our treatment plants. Accordingly, the content of sludge is highly variable, not only from town to town, but even at a specific treatment plant.

The next logical question is "How is sludge being disposed of in New Hampshire"? In 1996, the New Hampshire Department of Environmental Services issued 83 permits to dispose of sludge, 42 of these permits involved the disposal of out of state sludge (including 18 permits for sludge from Lowell, MA, 17 from Brattleboro, VT). New Hampshire issued permits to dispose of over 11,000 cubic yards of sludge from Lowell, Massachusett's treatment plant alone. On a single twenty five acre site in East Conway, NH DES issued a permit to spread 12,000 cubic yards of sludge. To put these figures in perspective, it is important to realize that Woodsville's Wastewater Treatment Facility generates only approximately 200 cubic yards of "exceptional quality sludge" per year.

The sludge spreaders promote the sludge disposal as recycling at its best - society gets rid of sludge and our farmers obtain free fertilizer. And we all, of course, want to help farmers.

Turn to page 7

# "Sewage sludge not recommended for forage or grazing"

Continued

They even have a nice name for it - "biosolids", which they say is "treated" sludge.

However, we all know that there is no such thing as a free lunch. If sludge is indeed such a wonderful, safe substance, why is it being given away? Why does Massachusetts and Vermont have to incur the substantial cost of transporting it to rural New Hampshire towns?

The safety of this substance is questionable. Up until 1992, sludge was often disposed of into the ocean - until Congress banned this practice because it was destroying our oceans.

Cornell University's Extension Services issued their 1997 recommendations for integrated field crop management. The section on the "Land Application of Sewage Sludges" includes the following excerpts:

"Application of sewage sludges is not recommended on land used for forage production or grazing. If used, incorporation into soils is particularly important"

"Do not use sludge or sludge compost on home gardens"

"Growers using sewage sludge should obtain analytical information on the metal and organic chemicals in the particular sludge or sludge product they are applying to their land. Regulations require testing for the very limited list of regulated metals and only at intervals determined by the size of the sewage plant. Analysis for arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, thallium, and zinc as well as nutrients are recommended.

"Because most heavy metals remain in the soil for a very long time, any additions should be considered permanent additions to the total quantity in the soil."

Although many studies have been done on the land application of sludges, scientific uncertainties remain, particularly with respect to the long term and to ecological safety. High application rates over several years of sludges with significant contaminant concentrations could result in soil levels of certain toxic metals, organic chemicals or both, which might impair soil productivity and present risks to human and environmental health. If sludge is used, limiting the amount of metals in soil to approximately 1/10 the EPA set cumulative limit is advised."

The comment discouraging the application of soils on land used for forage or grazing is interesting because, in 1996, in New Hampshire, 78% of the sludge permits were for agricultural land spreading of sludge. This is even though New Hampshire's Best Management Practices states:

"Since limited research data exists of biosolids application in New England soils, UNH Cooperative Extension prefers to see biosolids first applied to non-agricultural land."

Dr. Standford Tackett, a chemist and expert on lead contamination, and Professor Emeritus at IUP's Chemistry Department, became concerned about sludge on the basis of its lead content alone. He is quoted in the article "Let them eat sludge", a PR Watch publication, as saying "The use of sewage sludge as a fertilizer poses a more significant lead threat to the land than did the use of leaded gasoline." He is further quoted as saying "All sewage sludge contains elevated concentrations of lead due to the nature of the treatment process. Lead is a highly toxic and cumulative poison than can cause severe mental retardation or death. From a standpoint of lead alone, sludge is safe only if you are willing to accept a lower IQ for the young children living in the sludge area. And what about the other toxins".

The sludge companies, and certain state bureaucrats have informed us that the weight of authority is against those experts who claim that sludge spreading is unsafe. They have promised to provide me with additional studies, which we will be happy to review. However, it is clear that, at the very least, there are differing opinions about the safety of sludge. Perhaps sludge is the ultimate "Trojan Horse" - foisted upon us under the guise of a gift, but really more dangerous than it appears. We must err on the side of caution and discontinue the practice of sludge spreading.

Sincerely,

Lara Wolter
Shirley Grilli
East Haverhill

JEFFERSON

Dunn 11/13/96

# A potential disaster

To the editor:

Last week in Jefferson two men representing a sludge landspreading company and intending to implement a landspreading program there, followed state law by offering an informative meeting. This company followed standard procedure. They ushered themselves into the community with the promise of free farm fertilizer. As usual, they hitch their wagon onto an old and respected name such as UNH to give themselves some credibility and a degree of trustworthiness and familiarity. This ploy is to calm the country folol and use up valuable time peddling nonsense instead of facts upon which residents can base important decisions.

I was invited by residents to monitor the process for quality and truthfulness. I assess the process as follows — poor on quality. Other informational meetings around the state include a State of New Hampshire Environmental Services engineer with the industry people to keep things honest. In the truth category, these guys really flunked. The outright lies which contradict USDA scientist Rufus Cheney and his numerous documents (Cheney is considered this country's foremost authority on sludge) and also they misquoted Dr. Estes of UNH, who wrote this state's "Best Management Practices" for handling sludge and who recently was quoted as saying, "I am not comfortable with the 503 regulations."

These misrepresentations only arouse my suspicions as to their intentions once they get their foot in the door. I have documents which prove these charming billies are either liars or grossly uninformed. I suggest their opportunity to profit by promoting a primitive program makes them dangerous.

Sponsored by the Coos County Conservation District, I attend sludge seminars, symposiums and workshops around the state to keep abreast of changes in this industry and to help North Country residents get the whole story.

Because the Jefferson meeting was so uninformative, I will endeavor to help my good neighbors become better informed and understand the seriousness of the misinformation given at that meeting.

The *Harper Collins Dictionary of Environmental Science* defines sludge as a "viscous, semisolid mixture of bacteria- and virus-laden organic matter, toxic metals, synthetic organic chemicals and settled solids removed from domestic and industrial waste water at a sewage treatment plant." Over 60,000 toxic substances and chemical compounds can be found in sewage sludge and scientists are developing 700 to 1000 new chemicals per year. Stephen Lester of the Citizens Clearinghouse for Hazardous Wastes has compiled information from researchers at Cornell University and the American Society of Civil Engineers showing that sludge typically contains the following toxins:

* Polychlorinated Biphenyls (PCBs);
* Chlorinated pesticides — DDT, dieldrin, aldrin, endrin, chlordane, heptachlor, indane, mirex, keypone, 2, 4, 5-T, 2,4,D;
* Chlorinated compounds such as dioxins;
* Polynuclear aromatic hydrocarbons;
* Heavy metals — arsenic, cadmium, chromium, lead, mercury;
* Bacteria, viruses, prototozoa, parasitic worms, fungi;
* Miscellaneous — asbestos, petroleum products, industrial solvents.
* Methylmercury (to the atmosphere) a highly toxic compound which accumulates in the environment and which can be a health hazard for humans.

Soils upon which sludge has been spread can never be allowed to return to its natural acidic state, otherwise the heavy metals can then leach out of the soil. The pH must be kept at or above 5.5 in perpetuity.

Sludge does indeed have some properties which have value as a fertilizing agent. However, it also has many undesirable agents which need to be carefully man[illegible] that makes sludge an un[illegible] for the busy farmer who does not really want to give up management of his virgin soils to outsiders whose primary business is refuse dumping.

New Hampshire is ahead of the pack in developing a viable beneficial use program for sludge and I am privileged to be invited by DES to participate in the process. The key word here is developing. Bottom line, Jefferson: This program is a primitive program in the process of being developed. It is undeveloped at present and mismanaged by dumping companies that zero in on uninformed farmers.

This writer believes that Jefferson has the potential to be the jewel of the entire Conte Refuge because of your tributaries, proximity to northern Presidentials, many trail systems, and Pondicherry Refuge. You do not need an undeveloped sludge program. I believe it would be wise and prudent to give this beneficial use program two or three years to get properly developed. There will be no shortage of this material.

Dale R. Miller
Whitefield

1/23/97



# On Both Side

**Lancaster**

January 23

# Company's Sludge Spreading Plan To Go To Hearing In Near Future

By PETER RIVIERE

The planning board will hear a presentation by Resource Management Inc. of Ashland about plans to apply sludge on the Henry Farnsworth farmlands on South Lancaster Road, bordering the Connecticut River.

Stockpiling of material is scheduled to begin in mid-February, if approval is granted.

Details of the plan submitted to Peter Kulbacki, the town's code enforcement officer, are limited, an issue he said would have to be addressed at the Feb. 11 public hearing on the issue.

Though eight parcels of farmland are listed with total and spreadable acreage, only one parcel is identified for spreading, said Kulbacki of the plan.

The Farnsworth Farm is 190 acres of prime river and bottomland, and RMI lists 168.5 acres as spreadable.

They identify wastewater treatment plants in Franklin, Concord, Hanover and Brattleboro, Vt. as being the sources of the sludge proposed for spreading.

RMI estimated that 80 percent of the property is floodplain and indicates that prior sludge applications have been made before the state required public notification and conducting an informational meeting on the topic.

Other area towns have either enacted or proposed tougher land-use rules to more closely control the practice. Whitefield has a comprehensive ordinance in place, while Stratford and Jefferson have ordinances proposed for town meeting votes.

Lancaster

different disposal areas. Town officials are trying to [illegible]

CARROLL COUNTY INDEPENDENT 5-14-97

# Sludge ordinance to be written by selectmen

By TERRY LEAVITT

MADISON — If there is to be an ordinance prohibiting the dumping of sludge in Madison, selectmen will have to write it.

That was the decision of the planning board when they met last Wednesday.

Selectmen had asked planning board members to write a zoning ordinance prohibiting the spreading of class B sewage or sludge, including the short paper fiber which was proposed for use in reclaiming a gravel pit last month.

Selectmen requested a zoning ordinance be written, Town Administrator Robin Frost said, on the advice of attorney Randy Cooper, "because it has more teeth," than a selectmen's ordinance. A zoning ordinance is prepared by the planning board then placed on a ballot to be voted on by all registered voters. If it passes, an ordinance must go through a similar ballot vote to be amended or rescinded. Selectmen can make and rescind ordinances without a vote of the town.

Selectman Percy Hill said he is concerned that if the ordinance is passed by selectmen, it would be too easy to change when new selectmen come into office.

"We're only doing this because of the tenor of that meeting," said Selectman Percy Hill, referring to the public hearing on the gravel pit reclamation. About 200 people showed up to protest the use of short paper fiber there.

Selectmen have already voted to put a temporary moratorium on the spreading of sludge in Madison. Hill said they hope to hold a special town meeting this summer to vote on the issue.

But Madison Planning Board Chairman Jim Deaderick said it is not a zoning matter because it affects the entire town, rather than what can and cannot be done in specific sections of town. He also said that if the board members decided to write an ordinance they would first have to set up a committee to thoroughly research the issue.

David Maudsley, secretary to the planning board, said the ordinance is more properly a health ordinance rather than a zoning ordinance.

Other planning board members agreed with Deaderick and handed the problem back to selectmen.

# Middleton planners ban biosolids

By DARREN STRITZINGER
Democrat Staff Writer

MIDDLETON – The Planning Board voted unanimously at a public hearing Thursday night for an amendment to its zoning ordinance that outlawed biosolids.

The amendment stated that "the importation, stockpiling or spreading of biosolids is prohibited."

"Some of that stuff is more powerful than the acids (companies) manufacture," said board member Norman Buswell.

Biosolids, more commonly referred to as sludge, is used by farmers to fertilize crop fields. The sludge is given to the farmers for free by companies such as Bio Gro and BFI Organics. Bio Gro is a division of Wheelabrator Clean Water Systems of Portland, Maine, and BFI Organics is a worldwide organization. Sludge companies are paid by wastewater treatment plants to dispose of the material.

"It's a big money thing," said Buswell.

Although the sludge issue has caused controversy in cities like Rochester, the issue was put to rest quickly by the board, for no one attended the hearing.

The unanimous decision was aided by a position statement from the Strafford County Conservation District. It is written in the statement that "the District neither encourages or discourages the use of sludge/biosolids in land applications for agricultural use."

Because the statement didn't promote or condemn the use of sludge, and admitted that more research is needed to make an informed decision, the board felt that it would rather act on the side of caution.

Board alternate Star Snyder said she feared that if sludge was used it would contaminate the water.

"Our water table is so high," said Ms. Snyder. "Anything you put down will be put into the aquifer."

A

# N.H. neighbors square off over imported sludge

By Alice Giordano
GLOBE CORRESPONDENT

MILFORD, N.H. – Nancy Amato is so desperate to stop her neighbor, state Senator David Wheeler, from spreading sludge on his land to fertilize a new crop of Christmas trees that she has rounded up a donation of 4,000 trees and recruited 97 volunteers to plant and care for them for free.

All Wheeler has to do is agree not to spread the sludge, which is made up of pretreated sewage and industrial waste. But Wheeler says he sees no need to take Amato up on her offer. The sludge, he says, will help enrich his soil and there is no evidence that it is harmful as a fertilizer.

"I don't think anybody is going to be eating Christmas trees," Wheeler said.

This skirmish is the latest in an intensifying war that some New Hampshire residents are waging against the widespread use of sludge as a fertilizer. Sludge (also called biosolids) is an organic material made up of pretreated sewage from municipal treatment plants. It also contains industrial waste from paper mills, hospitals, and manufacturing plants.

For example, the sludge slated for Wheeler's farm is coming from a Vermont paper mill, according to state Department of Environmental Services records.

While all states produce sludge, New Hampshire is the only state that imports it. It is also the only state that has not adopted any regulations of its own regarding the use of the material as a fertilizer on land, according to Hugh Kaufman, an EPA senior engineer.

In 1997, 30,328 wet tons of sludge produced in New Hampshire were spread on land. An additional 23,278 wet tons were imported from states including Massachusetts, Vermont, and Maine, which have much stricter laws regulating its use. Seventeen dairy farmers in New Hampshire use sludge as fertilizer on their grazing fields, according to state records.

Five of those farms used sludge that came from the regional wastewater plant in Lowell, Mass., which serves as the waste disposal facility for Lowell General Hospital, Lockheed Martin, and the Silresim superfund site, a former chemical treatment facility in Lowell, records show.

"New Hampshire has become a sludge dumping paradise," said Steve Schiller, a Newbury resident

SLUDGE, next page

Milford.

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# Neighbors have growing concern over sludge

■ SLUDGE
Continued from preceding page

who cofounded a group against sludge after tons of it were spread near a drinking water aquifer in South Newbury in 1995.

Schiller's group, Newbury Resources Protective Association, along with several national environmental organizations, including the Sierra Club, contend that sludge is an unregulated toxic material that could eventually leach into crop products and drinking water.

Environmental groups last month petitioned Governor Jeanne Shaheen to enact a statewide moratorium on the spreading of sludge. Doug Bogen, New Hampshire program director of Clean Water Action, which organized the petition, said his group's main concerns are contaminants like PCBs and dioxins and the high amount of mercury in sludge. In 1996, he said, 1.6 tons of mercury were spread on land in New Hampshire.

"Our precious loons are already carrying the highest mercury levels of any in North America," said Bogen. "Does it make any sense to deliberately add this much more to our environment?"

Proponents of sludge say there is no proof that it has any environmental or health risks. And they note it is a very effective fertilizer and a relatively inexpensive solution to the problem of waste disposal.

John Walker, a physical scientist with the federal Environmental Protection Agency, said sludge is no less safe to use than animal manure, which isn't even pretreated the way sludge is at municipal treatment plants. Horse manure, Walker said, actually contains higher levels of PCBs and dioxins than biosolids do.

"The fears are not supported by the research," Walker said. He noted that the EPA conducted a risk assessment study of land-applied sludge and found no link between sludge and animal or human illnesses.

Studies by the EPA have also found that it takes some 300 years before the metals in pretreated sludge, which include lead, arsenic, mercury, and cadmium, find their way into the soil, and by then they have lost most of their potency.

But other research, notably a study by scientists at Cornell University, has found that the metals in sludge leach into the soil almost immediately after the material is applied to the land.

"EPA is looking at top soils; we're looking below the root," said Murray McBride, a soils chemist at Cornell and one of the researchers, in explaining the discrepancy between the two studies.

Joanne Marshall of Greenfield says she doesn't need a study to tell her something is wrong with



GLOBE PHOTO / BARBARA HOBSON

**Tom and Joanne Marshall believe sludge dumped in their area may have contributed to the death of Joanne's son, Shayne Conner.**

sludge. Her son died on Nov. 24, 1995, a few weeks after he walked through a hayfield where some 4,000 tons of sludge from a waste treatment plant in Portland, Maine, had been spread.

The state medical examiner's office ruled the cause of his death as unknown. Then Acting Chief Medical Examiner James Kaplan immediately ruled out the possibility that the sludge played any role in 26-year-old Shayne Conner's death.

But his mother won't accept that. In the weeks before Conner's death, she says, three of her neighbors were rushed to the hospital for breathing problems; three others were treated for outbreaks of lesions on their backs, chests, and limbs.

Jonathan Balthaser, 24, developed a skin rash that he said resembled a bad sunburn, and Cathy Hamilton, a registered nurse, was bedridden with nausea and severe diarrhea.

On the day the last load of sludge was hauled in, Dave Delfino, a retired plumber, said a foul stench filled the air that burned the inside of his nose so bad it bled.

Officials of BioGro, the division of Wheelabrator Technologies that oversees the company's sludge business, say Greenfield residents blamed the sludge for their illnesses because they didn't like its odor. But there is no proof, they say, that sludge spread by BioGro caused any ailments.

Ann Bosiak, technical services coordinator for BioGro, says she has personal proof sludge is a safe product for farming. Her family runs one of the 17 dairy farms that uses biosolids as a fertilizer.

"We've been using it for four years and it actually increased wildlife activity [like deer and grouse] and improved the health of our dairy cows," said Bosiak.

Mitard

(7)

FOSTERS DAILY DEMOCRAT
AUGUST 21, 1997

# Sludge proposal angers residents

## Opinions voiced at Milton hearing

By BRIAN HANNON
Democrat Staff Writer

MILTON — Fear and loathing of bio-solids, commonly known as sludge, erupted again Wednesday during a public hearing concerning a local farm's plan to spread the fertilizer.

Although the gathering at the Planning Board building was heated at times and a petition against sludge was circulated, the meeting was purely informational and the owner of Branch Hill Farm still plans to spread bio-solids on the land.

Cynthia Wyatt, whose father, Carl Siemon, owns the farm on Applebee Road in Milton Mills, said the farm has spread sludge in the past but state statute dictates that a public hearing must be held following any application to spread bio-solids.

Ms. Wyatt explained that after the acceptance of state standards concerning sludge at the Town Meeting in March, Branch Hill Farm decided to spread Class-B bio-solids again this year. The 1,700-acre farm recently submitted an application to spread bio-solids in the coming fall under the direction of White Mountain Resource Management Inc. of Ashland.

She said the farm has 100 acres of hayfields but, because of setback regulations concerning the distance required between bio-solids and certain objects and dwellings, will spread the fertilizer on only 48 acres.

The abutters to the farm, however, are not happy.

In a series of heated exchanges that at points digressed to near-shouting matches, neighbors of the farm expressed displeasure and concern over the spreading of sludge at Branch Hill Farm.

Betsy Boulton, a University of New Hampshire professor who lives on Applebee Road, cited several reports and studies concerning bio-solids that point at the potential hazard caused by materials in the substance, including heavy metals.

She expressed concerns about the water table height in the area and whether sludge residue will seep into local wells.

"If sludge is so good, why don't you sell it?" Ms. Boulton asked. She suggested that White Mountain Resource set aside $10,000 for testing of area land and water sources to be overseen by an independent panel not affiliated with Branch Hill Farm.

Another woman in the audience emotionally noted that at times during the year her yard fills with water that runs off from the farm and asked what effect the sludge would have on her young daughter.

A pair of White Mountain Resource company officials attempted to alleviate fears by addressing the individual questions and concerns of residents, explaining the required setback distances, liability, amounts of heavy metals in bio-solids allowed by the state and federal governments, and spreading procedures. They noted that Branch Hill Farm will use anaerobically digested bio-solids, which are low in the odor commonly associated with sludge.

A large part of the meeting was marked by constant interruptions and sore feelings and, in the end, both sides agreed to disagree and quietly left the hall.

☆ *Sludge*
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Newbury CONCORD MONITOR

# Warm weather raises a stink at sludge site

## New state rules try to cover smelly subject

By JIM GRAHAM
Monitor staff

NEWBURY – While most people were praising the unseasonably warm weather, if not the rain, members of a state highway crew were holding their noses yesterday. They said it just plain stunk.

A combination of rain, melting snow and stagnant air triggered such a stench at a sludge-spreading site off Village Road that five workers at the nearby state highway equipment shed were nearly sent home early.

"They've got headaches, their eyes are burning and everyone feels sick," said Steve Chellis, the crew's foreman. "... It smells awful, and we feel awful."

The crew stayed through its shift, however, after being assured that the air would be cleared by the end of the week, or sooner.

The odor came from an adjacent privately owned gravel pit where treated sludge and paper fibers are being used to create new topsoil. The mounds of sludge began to smell, however, as the weather warmed and before they could be covered with sand.

"In no way do we want to do anything to create an odor problem there," said John Balet of BFI Organics in Tilton, which is spreading the sludge. "... It's just that we've hit an unusually bad stretch of weather for an operation like this."

The sludge comes from Concord's wastewater treatment plant and is mixed with wastepaper from two paper manufacturing plants. The sludge is treated to eliminate health hazards before it leaves Concord, and the odors are not a health threat, Balet said.

But odor complaints about other sludge-spreading sites around the state prompted the Department of Environmental Services to adopt emergency rules in November. A draft of long-term rules, which was finished yesterday, should be presented to the Legislature for approval by late March.

In Newbury, the sludge is being mixed with sand to create topsoil and reclaim a barren, 24-acre gravel pit. The operation complies with state and federal standards, Balet said.

"Nothing seems to be working in our favor as far as the weather is concerned," Balet said.

■ See SLUDGE – Page B-8

The company is moving the sludge, mixing it and burying it this week, which contributes to odors as the material is disturbed, Balet said. Once the operation is completed, the odor should be reduced dramatically until spring, when the spreading operation will resume for several days.

Michael Rainey, of the Department of Environmental Services, said sludge can be an ideal fertilizer. He has received several complaints about the Newbury site in the past two months, and inspectors have toured the area. He said BFI Organics has cooperated with state orders.

Both the state's emergency and proposed rules include measures to control odor problems.

They stipulate that sludge has to be treated to eliminate any disease-bearing organisms or health threats before being spread. Sludge can be stored no longer than six months, and must not be spread within 500 feet of a property boundary. Before November, there were no storage or setback limits.

Sludge left in the open must also now be covered within seven days. Those who are using treated sludge must also file a detailed odor control plan, specifying how odor problems will be addressed.

NEWBURY

Newbury

GRANITE STATE NEWS 9-11-96

# Residents protest biosolids projects

By NATALIE PETERSON
CENTER OSSIPEE — Plans for the application of biosolids recovered from the wastewater treatment process in other towns to two Ossipee sites have drawn strong opposition from some neighbors.

BFI Organics plans to apply approximately 6,950 cubic yards of BioMix Soil on property owned by Mark Wright of Terrace Pines Campground in the Dan Hole Pond area. The material is being used to stabilize the land and limit erosion, and to fertilize and revegetate a recently cleared field. Wright is planning to develop a Par 3 golf course for the enjoyment of his campers. The campground has approximately 500 camping sites.

A second site for the application of biosolids is on 80 acres of the 120-acre tract known as Bickford Forest, off Plains Road in the Elm Street vicinity. This is to be a demonstration and research project conducted by Wheelabrator Water Technologies, Inc., the University of New Hampshire and the Department of Environmental Services.

It is estimated that the Wright site will require delivery of 15 to 25 loads per week, beginning in October and ending no later than June 1997.

Details of the Bickford project are expected to be available this week, but the project is expected to begin in October, also.

Neighbors affected by each of the projects were joined by other Ossipee residents who are concerned about potential odor, possible contamination of wells and other nearby water sources, and fears of health risks.

They wanted selectmen to stop both projects. "Ossipee doesn't deserve this," said Kevin Maguire of Barrington Circle, who expressed his concerns about the Bickford Forest project.

"You're asking us to stop something we have no control over," replied Selectmen Chairman Joseph Skehan. State and federal permits have already been issued, he said, and there are no local ordinances to prevent either project from going ahead.

Skehan tried to soothe some of the concerns, pointing out that there are many state and federal regulations that must be met before approvals are issued for such projects. He also said that two other Ossipee locations are used for biosolids application. Virgil Abbott of West Ossipee has used the materials in a farming operation, and David Babson of Brown's Ridge Road is using biosolids to help growth of fields needed to feed his cattle.

Skehan said he "has no problem" with the projects and that he didn't believe Mark Wright would do anything to jeopardize his livelihood and a business his family has operated formore than 50 years. "I can't believe he'll destroy that, and he lives right there," Skehan said.

He also said, "Mr. Bickford is one of the most respected loggers in the area."

His comments seemed to do little to assuage the fears of those opposed to the projects. Frank and Ann Burridge, also of Barrington Circle, presented selectmen with some written information based on his research of similar biosolid applications elsewhere. Both questioned long-term health risks, possible well contamination, and other problems.

They questioned the effectiveness of the materials as fertilizer based on information obtained from a UNH professor of civil engineering who will be the scientist connected with the Bickford project.

Ossipee resident Richard Cogswell said he was bothered by "the ramping up" of the projects. "Today I read about the Dan Hole area. What I'm seeing is going from a little agricultural spraying to covering 100 acres a foot deep. Why aren't they doing this in Wolfeboro? Why Ossipee?"

Ultimately, selectmen advised concerned citizens to draft an ordinance for consideration at town meeting, one which would prevent or restrict such sludge operations in Ossipee. The board also agreed to hold a public information meeting as soon as possible, inviting the two companies involved in the newest project to attend and respond to citizen's concerns.

## Sludge

Continued from 1

while Mark Wright had arranged a program with BFI Organics.

Two other residents who have allegedly prepared land for sludge-spreading, including state Rep. David Babson Jr., will also be notified.

The letter asserts that spreading sludge will be considered a violation of town bylaws.

It adds that such a violation will be punishable by a fine of not more than $100 per day along with any further fines and fees.

The 1975 bylaw banned the import of any sludge from outside Ossipee, other than to a municipal facility.

What the two firms in question will do remains to be seen. Litigation that might force the town to accept sludge, or that might overturn the entire bylaw, is possible but may be unlikely.

Ann Bosiak, spokeswoman for BioGro, said Monday her company had not made decision about how to proceed in the event of a town ban but would not be eager to employ litigation

*Ossipee selectmen decide:* LAKES REGION COURIER 10/10/96

# Sludge is not welcome

OSSIPEE - The ball is in the court of those who wish to spread sludge, called "bio-solids," in Ossipee.

The selectmen Monday night approved a letter declaring the town off-limits and vowing to stand behind a bylaw passed by voters in 1975.

The letter, signed by all three selectmen, will be sent to Wheelabrator Water Technologies' BioGro Division, in Portland, Maine, and BFI Organics, in Northwood.

BioGro planned to use forest acreage owned by Fred Bickford.

See Sludge, page 22

OSSIPEE

Rochester

ROCHESTER

OPTIONAL FORM 99 (7-90)

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IN ROCHESTER

# Sludge firm pulls out applications for area sites

By GEORGE WATSON
Rochester Bureau Chief

ROCHESTER – After last week's meeting on sludge, where more than 120 residents turned out to angrily oppose the use of the fertilizer, a sludge company today announced plans to withdraw applications for two sites.

Jon Kallen, a technical services coordinator for Bio Gro, a division of Wheelabrator Clean Water Systems Inc. in Portland, Maine, said a letter will be sent to the city's Code Enforcement Office ackowledging the company's intentions not to spread sludge on 4 Rod Road and Chesley Hill Road.

The withdrawal comes just before tonight's public hearing at 7 p.m. at the Community Center on 150 Wakefield St. Tonight's meeting was scheduled after an information meeting held last week nearly got out of control as residents vehemently expressed their desire not to allow sludge in their neighborhood.

But the withdrawel may not be permanent.

"Based on how the meeting goes tonight, we may resubmit (the applications at a later date)," Kallen said.

Sludge, otherwise known as biosolids, is used by farmers to fertilize crop fields. The sludge is given to the farmers for free by sludge companies like Bio Gro and BFI Organics. Sludge companies are paid by wastewater treatment plants to get rid of the material.

City Councilor Chuck Grassie, who is the chairman of the Biosolid Committee, which is hosting the meeting, said he is unsure what to expect to-

☆ Sludge
Please turn to Page 10

**Sludge** Continued from Tri-City Page

night. But he said he wished the people objecting had attended meetings held this past winter when the committee was setting sludge regulations.

"Our committee does not have the ability to determine what sludge goes on an individual site," Grassie said.

Richard Cartier, who is one of the leaders of the sludge opposition, said this morning the group plans to fight any use of sludge in Rochester. He also blamed city officials for not helping residents.

"As far as I'm concerned, the city council was not working for the residents," Cartier said. "I want to see that sludge is getting out of Rochester totally."

Councilors banned sludge use for several months earlier this year but then set stringent regulations allowing its use if spreading is conducted in a controlled manor. Residents are objecting because of health and odor concerns.

Sludge has been used at one site since councilors approved its use. But other applications are expected from BFI Organics. Officials from BFI were unavailable for comment this morning, but someone from the company is expected to attend tonight's meeting. Officials from Bio Gro also are expected at the meeting.

Grassie said the Police Department will be stationing officers at the meeting to ensure order is kept throughout.

Rochester

# Letters to the Editor

## Now is the time to show your interest in the sludge problem

To the Editor:

I possess a weighty Helane Shields sludge information packet, the one she sent addressed. "Dear Town officials." Readers' towns' selectmen received these in February before Town Meeting.

A Cornell University Extension Publication of January 1997 shows that New York and Vermont propose lowering by half and more the allowed amounts of arsenic and cadmium in "fertilizer" sludge. Only the EPA and New Hampshire stick with a high level. New York and Vermont propose to reduce EPA-allowed lead amounts by more than half also, but not New Hampshire.

Ms. Shields points out that paper mill sludges contain dioxins. We must remember, from the past, that dioxin-laden waste oil applied to roads caused the closing down of the town, Times Beach, Missouri, Brattleboro, Vermont, has already sent Class B paper mill wastes into New Hampshire as "Fertilizer" sludge.

Ms. Shields; 48 pages include information about law suits from around the country, involving after-effects of sludge spreading. A *Dairy Today* article (March 1992) proposes that farmers who spread sludge should have the means themselves to test the metals content of every load, but "a test for 10 heavy metals and PCBs cost $250 per sample. Dioxin test are $2000 per sample."

Washington State Farm Bureau President Darrell O. Turner is quoted as saying, "Can you trust the analysis that you get when (the producers) are desperate to get rid of the stuff at the least possible cost?" And, "You are confronted with a finite limit of how much you can put on the land. Any more can cause irreversible damage to the soil and groundwater."

I want to include, as I write this on Earth Day 1997, lines from Donald Hall's "The Old Life," about Eagle Pond in Danbury: "One year the pond turned orange and stank, seepage from money's dump, and we stopped visiting Eagle Pond on summer afternoons, one subtraction among the days that five, take away, give, take."

Donald Hall tells me that Eagle Pond did recover after about three summers being ruined. "The dump was lifted up and lined in plastic and covered," he writes. But also, "How long will these last? Probably a long time ... But manganese may eventually slip through again."

What sense, spreading this industrial waste that expertise of the time allows, but later expertise will explain to us as well-intentioned error?

Again, I think we should be grateful for Helane Shield's determination. If readers' selectmen mentioned (or didn't) her packet and the topic at Town Meeting, as mine did at the Rumney town Meeting, they may be waiting for townspeople to show an interest. Spring 1997 may be just the time to show your interest. It's your town that's on the sludge-seller" "available" list, other wise.

Lynn Rudmin Chong
Rumney

The Granite State News
'The Grunter'
J. J. Burghardt, Publisher — Jeanne Tempest, Editor
Editorials, while unsigned, represent a consensus of the views of the publisher and editors of the Granite State News and Carroll County Independent.
The Granite State News now on line at http://granitestatenews.com
Email Address: gsn@conknet.com
Est. 1859, Wolfeboro, N.H. 03894
Vol. CXXXVIII, No. 20, Wednesday, May 14, 1997

Rumney

Rumney

Sent by: Workcenter 250 6032698

# Sandwich Talks Tough On Sludge

## Proposed Rules Would Virtually Ban Spreading

By BEA LEWIS
Northern Lakes Region Bureau

SANDWICH — A citizens' committee charged by townspeople with developing regulations to control the disposal of sludge supports the adoption of a health ordinance that is so tough a biosolid industry official said he believes it would effectively halt the practice.

**INSIDE:** *Tilton voters to act on two sludge ordinances.* Page 3

Charlie Hanson of RMI, a company that land spreads biosolids, commented during a public hearing held Tuesday that the proposed regulations are so restrictive that it would probably not be economically feasible to dispose of sludge in Sandwich.

"With these regulations I doubt that there will be much land spreading," he said.

Selectman and sludge committee member Ben Shambaugh said in his opinion the proposed ordinance is sufficiently restrictive that it would ban the disposal of sludge on all but about one percent of the available acreage in the community.

"I'd stake my reputation on it as dubious as it is," Shambaugh said.

But despite those assurances, some 20 people who attended the two-hour hearing urged the committee to adopt an outright ban on applying sludge to forest land, and to prohibit industrial sludge from being spread in the community. Following the hearing, the committee met and voted to include the two additional restrictions in the ordinance that will go before voters at Town Meeting in March.

Committee Chairman Chip Kimball said he believes that Sandwich has a moral obligation to help dispose of sludge because it helps create it.

"We have an obligation to help dispose of our own poop," he said.

Skip Hoag, a hydrologist and fellow committee member, said he too sees an obligation to be part of the solution. But he believes that the municipalities that have adopted outright bans on sludge disposal may eventually face a legal challenge from either the state or federal government.

But committee member Caroline Snyder, who taught environmental studies at the college level for more than two decades, argued land spreading is not a solution but a liability.

"If you want to be part of the solution don't use toxic chemicals in your household and use paper made without chlorine," Snyder said.

The Environmental Protection Agency, Snyder charged, has identified 126 priority pollutants in sludge. Those pollutants, she said, could cause death, cancer, other diseases and adverse health effects if they are ingested, inhaled or absorbed directly through the food chain.

One of the priority pollutants is dioxin, according to Snyder, who characterized it as the most potent animal carcinogen ever tested.

Fifty percent of the sludge now dumped in New Hampshire comes from out-of-state, according to Snyder. And existing state regulations, she claims, are the least restrictive in the Northeast.

She joined members of the audience in urging the committee to ban paper mill sludge from being spread in the community and for forest land to be protected from the practice.

Local resident Robert Wright recounted how dirt roads in town were once oiled to control dust. When local residents complained about the pungent smell of the oil, it was tested and found to be laden with toxic substances.

"When the truck left Massachusetts it was filled with oil but by the time it arrived in Sandwich it contained all kinds of chemicals," he said.

While selectmen immediately halted the practice, Wright said, he still harbors some distrust.

He urged the committee to decrease the maximum allowable site size for sludge spreading from 20 acres to five acres.

Based on the numerous setbacks mandated by the proposed ordinance, Kimball said reducing site size to five acres would essentially preclude the spreading of any sludge in the community.

Selectman Bob Rowan urged the committee to "err on the side of caution," and ban the use of paper mill sludge and prohibit sludge applications on forests.

"Strong regulations give us the protection the town needs when down the road the state or federal government says you can't ban this," Rowan said.

"Why do we punish ourselves? Some 76 towns in the state have said no to sludge. Let's say no to sludge," urged Jeff Fleischmann.

Members of the committee recommend that townspeople vote no on a ballot question March 10 that seeks to extend the existing one-year moratorium on sludge spreading and charge the Planning Board with developing controlling regulations.

The committee, Shambaugh said, believes the issue should be handled as a health ordinance because it could be more quickly amended by selectmen if changes are warranted.

Meanwhile, two other warrant articles will face voters at Town Meeting, March 11. The first asks that selectmen be empowered to adopt the ordinance as proposed by the sludge committee. If that measure is defeated, a second warrant article asks for the moratorium to be extended and another committee formed to study the issue and develop recommendations.

WEDNESDAY, JANUARY 28, 1998
The Citizen

Sandwich

Sandwich

Foster's
2/20/97

# Biosolids and common ground

Kimberly F. McGlinchey
Strafford

## Community Commentary

In several weeks, March 11, the townspeople of New Hampshire will come together at their local town meetings to make decisions on some very important issues. They will unite in their respective towns to reap the benefits of a democracy.

The New England town meeting is one of the best models of a true democracy left in the United States today. Each voter at a town meeting has as much power and respect as anyone else. The issues at a town meeting are brought in by individuals, but the town is quick to transform the ideas into circumstances that will benefit the common good of the community. Because of this great opportunity, we as citizens, have a responsibility to participate and make solid conscious decisions. We need to be open-minded and informed; we must abandon our individual wants and attitudes at the door and become community focused; pursuing the "common ground." In other words, we need to address what is best for the whole, not just the parts. Some of the issues presented at a town meeting are controversial and emotionally charged. The sludge issue is one such issue.

The spreading of sludge/bio-solids has become a major concern of the New Hampshire townspeople. The facts and figures of the issue go back and forth daily in our local papers. When forced to make such a decision we must not only look at facts and figures, we must also investigate the principle of common good and find the common ground.

The principle of common good involves the complex subject of ethics and values. Because this is a land use issue it involves ecological, as well as agricultural ethics. This really boils down further to the subject of land ethics. A strong land ethic involves consideration for all of the biotic community, including soil, water, plants and animals. It concerns the concept of man as steward or caretaker of the land, as opposed to conqueror. According to ecologist Aldo Leopold "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community, it is wrong when it does otherwise" (Leopold 1949: 224-225). What Leopold was trying to say is that we should think of long term, as well as short-term effects to all species before changing the environment and when changing that environment we should preserve its health and stability. Land being a large part of the environment, it is directly applicable here.

The application of anything to our land should be carefully considered, whether it be pesticides, chemical fertilizer or sludge. The health of our soil is critical to the survival of a healthy community. The common good of the community is therefore directly related to the health of the soil and plant and animal life. Short term economic gain should not be a deciding factor. Long-term sustainablity of our fields and forest should be.

We have a responsibility to maintain the quality of land for future generations of humans, as well as, plants and animals. This is the common ground at the heart of the sludge issue. The preservation of the quality of land to ensure the continued health of the community must be the shared goal. The application of bio-solids to our land is controversial because it does not preserve the health of the land for long-term usage.

What sludge does do, however, is to provide us, as a community, with an opportunity to take a closer look at exactly what the "common good" is. It allows us an opportunity to examine our future and to see what our towns' land ethic is. Should we sacrifice long-term sustainablity of our land for short-term economic gain? Should we consider the other animals and plants or just the human factor? Should we think of future generations or just the here and now?

Coming to common ground on these issues is what the sludge issue is all about. On March 11 the bells of democracy will ring, as we come together, once more, in search of common ground.

Strafford

Carroll County Independent Wednesday, September 10, 1997

# Selectmen hear details of pit reclamation project

By VERA MATTHEWS

TAMWORTH — Thomas Lindsey and Bruce Robinson were appointed to a three-member committee to study biosolids by the selectmen at their Sept. 4 meeting.

The third member of the board, Marlene Ostrowski, was chosen by the Conservation Commission at its Monday, Sept. 8 meeting.

In a telephone interview Friday, Robinson said he would be representing the selectmen, and Thomas Lindsey the citizens at large. He said the purpose of the committee is to gather more information on the spreading of biosolids in Tamworth for use in future decisions to be made by the town. Robinson said Lindsey had expressed an interest in the subject.

Ned Beecher, project assistant for White Mountain Resource Management, Inc. in Ashland, presented to selectmen at their Sept. 4 meeting the management plan for the reclamation of the Ambrose Brothers, Inc. pits. The four pits are located on Pine Hill Road off Route 113. He said a site permit application and a facility permit application have been submitted to the state. A copy of each is available at the town office for viewing and copying by the public.

When Selectman John Roberts asked who decides whether the site meets requirements, Beecher replied, "The state, Ambrose Brothers, Inc., and our company."

Chairman Robinson asked who would be responsible if the site proves hazardous and needs cleanup. "Our company," said Beecher.

Robinson also asked who monitors the storage of the material. Beecher said the trucks from White Mountain Resource Management, Inc., do the hauling and when it is stockpiled, "We monitor it."

Beecher said the company has contracts to manage land application programs. He said when the containers at the contract companies are full, White Mountain Resource Management, Inc., arranges for sites and works out the rate at which it is applied. The rate is based on the level of nitrates and nitrogen in the soil.

Ambrose Brothers, Inc., will do most of the work, he said. It is their machines, time and labor.

The Power Line Pit will be the first to be completed, Beecher said. Then the Upper West Pit will be done, he said, but probably only six acres. The Upper East Pit will be ready in a few years, and Jackman Pit may never be done.

The next step is a public hearing to be scheduled by the Department of Environmental Services, Beecher said. The state is required by law to post notices of the meeting in the newspaper. He said White Mountain Resource Management, Inc., will also be notifying abutting landowners by letter of the meeting's date, place and time.

An abutting landowner, The Community School, was represented by its director, Martha Carlson. She said she found out by accident about this meeting. She presented the selectmen a letter from the school, opposing the plan.

She presented to the selectmen a petition against the plan signed by 11 Tamworth residents and said the petition is still available for signatures.

Carlson said the school has a 110-foot-deep well which was drilled through pure sand. The well was pumped for four days and still did not go dry. "It could serve all of Boston," she said.

The school has a staff of 20, and a garden that feeds 35 families, including the local food pantry. Because the well serves more than 25 people, she had to become a Certified Well Operator, and must test for 16 elements, six compounds, bacteria and 43 inorganic petro chemicals. She said the town and the Brett School must also do the same tests on their wells.

The state gives a free map that shows "potential polluters" within a circle around each well. The Ambrose Brothers, Inc., pits are among them.

After a recent heavy rain storm, the test results came out differently. She said this shows how easily the well could become an economic and health disaster for the school, the town and her, if the reclamation of the pits does not work out as planned.

Carlson said, "I will sue."

Beecher said, "These materials do not pose a threat to ground water. Metals do not leach out of this soil."

State law requires a company engaged in biosolid spreading to notify the landowner abutting any property the company owns. Beecher said that means Ambrose Brothers, Inc. must notify landowners who abut company property that is no where near the pits in Tamworth.

Caroline Snyder, an abutter from Sandwich, also spoke and presented the selectmen with a petition signed by 6 Sandwich residents against the plan. She is a retired teacher of environmental studies at the Rochester (N.Y.) Institute of Technology. She said the regulations of this material is the least stringent in the world. And, she said, New Hampshire's regulations are the least stringent in New England. Sandwich now has a one year moratorium on sludge, she said.

Snyder said there is no consensus in the scientific community that this is safe. She said gravel pits are regulated by the state, but towns can say "No" to sludge.

Monitoring by the state is inadequate, she said, because there is not enough staff.

Tamworth

18/73

Tamworth

Vol. 71, No. 230 Laconia, N.H. The Citizen Laconia Sept 26 1997

# Board Limits Sludge Spreading in Tilton

By GORDON D. KING
Staff Writer

TILTON — Using their authority as town health officers, the Board of Selectmen has voted to ban the spreading of sludge in town unless it meets strict federal requirements.

"We want to make certain if the material is allowed in town it is the best material there is. It must meet stringent federal guidelines," said Chairman of the Board of Selectmen Heber Feener.

The selectmen adopted the regulations Thursday.

State regulations allow what the chairman referred to as Class B sludge. Federal guidelines supersede these and control what is called Class A sludge.

The board's action follows receipt

SLUDGE, Page 10

## ■ SLUDGE,

From Page 1

of a petition from residents who objected to a proposal to place sludge on land off School Street.

Owner of the land Nathaniel Thayer wants to use sludge to help reclaim it, according to his brother George Hast who manages the site.

The reclamation of the former gravel pit process was to include the spreading of sludge from a Lowell, Mass. plant.

Selectman Feener said the board used expert help in drafting the ordinance to make certain the town is protected.

"We want to make sure the material is clean so we don't have a problem later on. Some people are upset with this, but we would rather be sure," Feener said.

The other two members of the board feel the same way, Feener said.

The selectman said some people are upset with the board's action but it is not aimed at one particular landowner or company. Opponents to the ordinance claim Class B materials used in accordance with state and federal guidelines are as safe as Class A materials.

"This is the right thing to do. What it boils down to is that this is a health issue. It's for the good of the whole town," Feener said.

The material can be used in town provided it is commercially processed and sold at retail for that use, or if the material is processed at a licensed municipal treatment plant and certified as acceptable by the town's independent engineer or laboratory.

The ordinance will not have to go to town meeting for approval by residents as originally believed.

Selectmen Feener said the Board of Selectmen also serves as the town's health officers and can adopt such regulations as a result.

Tilton

# Viewpoint

## *Smelling a rat*

The ongoing sludge debate in Whitefield and Twin Mountain highlights a mounting global problem of what to do with the world's waste.

A New Jersey corporation, Environmental Protection Improvement Company, wants to spread imported sludge (treated sewage) on approximately 1,700 acres of clear-cut land in the two towns. That, at least, was the original proposal. Later, EPIC said it wants to establish two processing sites as well, one in each town, sites that would smear a total of 120 acres, 70 in Whitefield and 50 in Twin Mountain, with sewage many residents fear would be only partially treated at best.

What we smell buried in the bowels of this proposal is a rat. Residents are right to be up in arms.

According to the Worldwatch Institute, every day each of Earth's five billion human beings leaves behind at least one pound of garbage. In industrialized, throw-away societies such as ours, that daily total can reach about eight pounds apiece. So what do we do with that mountain of waste? About 75 percent of this nation's landfills are already full.

One relatively recent "solution" is to ship it somewhere else, another city, another state, another country. That is essentially what is happening in Twin Mountain and Whitefield.

Recycling helps. The success of Littleton's transfer station is local evidence of that. Treating sewage so the resulting sludge can be safely used as an agricultural fertilizer is a form of recycling and there is nothing inherently wrong with it.

But, despite claims that the sludge will fertilize a new growth of trees, that does not appear to be what is happening in the two North Country towns. Many local residents and town officials believe--and the evidence would seem to support--that the 1,700 acres will be nothing more than a dumping ground for New Jersey waste.

Ted Ingerson, the logger who owns the land EPIC would lease, stands to profit from that, of course. No doubt his claim that landowners have a right to use their land pretty much as they please rings a bell with a lot of independent-minded Granite Staters. But his neighbors have legitimate concerns about health and other environmental hazards--including the stink--that cannot be confined to Ingerson's 1,700 acres.

We doubt that Whitefield Selectman Alan McIntyre really expects EPIC to put up the $10 million bond he proposed as insurance for the two towns. But his point is well taken. If 10 or 20 years down the road the site turns out to be an environmental nightmare and EPIC is long gone, the towns could be stuck with a costly clean-up.

Clearly, area residents are wise to be concerned and vigilant. We should not let the North Country become some urban area's outhouse.

Twin Mountain

THE COÖS COUNTY
DEMOCRAT
ESTABLISHED IN 1838 VOL. CXXIX NO. 42 LANCASTER, NEW HAMPSHIRE

# Sludge proposal draws public ire

By Eileen Alexander

WHITEFIELD—Well over 100 people attended a public hearing at the Whitefield Town Hall last week to ask questions and offer their opinions on a proposed sludge spreading operation on a parcel of clearcut land owned by Ted Ingerson on Route 3.

Although Planning Board Chairman Stan Holz cautioned the group to remain objective, the subject was obviously an emotional one for many who attended. "I've received more inquiries and phone calls in the last six weeks on this project than on anything else in the last two-and-a-half years," said Selectman Alan McIntyre. "I've lived here all my life and expect to die here, and I think that there are genuine concerns that have to be addressed."

Mr. Ingerson is leasing his property to a New Jersey-based concern, Environmental Protection and Improvement Company. EPIC plans to spread bio-solids, or sludge, from municipal wastewater treatment plants on the 1800-acre clearcut parcel in Whitefield and Twin Mountain. EPIC representative Mike Hannon said that his company currently has a contract to dispose of sludge from the Lynn, Mass. wastewater treatment plant and will also be bidding on contracts in Franklin and Manchester, N.H.. According to information that Mr. Hannon gave to the Planning Board, EPIC intends to use the 700-acre Whitefield site for direct land application of sludge for reforestation; for soil blending with compost and top soil; and for composting with other organic matter. The company will use bio-solids from New Hampshire sources as well as "high-quality" bio-solids from other states. Detailed plans for the site were not available at the time of the public hearing.

Mr. Holz said that the Planning Board couldn't reject the project out of hand. The town's Community Development Guide allows for a mix of uses in all areas of town, provided that the project meets the goals and objectives of the town's Master Plan, and provided that the project conforms to certain criteria outlined in the Guide. Mr. Holz said that the state would be watching what happens in Whitefield and Twin Mountain because, thus far, sludge has never been spread on a large clearcut parcel. EPIC must provide a Best Management Plan for the Planning Board's review, including a plan to deal with wetlands, slope and other potential site problems. If the plan is eventually approved, said Mr. Holz, it would most likely involve a phased-in approach.

"We are planning a soil analysis for the entire site," said Mr. Hannon. "This project is unique because of the clearcut nature and we believe that bio-solid application will enhance new growth. We don't want to do anything to harm the residents of town." He said that EPIC plans to treat the Whitefield and Twin

(Continued on Page 2)

03595.

Woodburn Funeral Home in Whitefield is in charge of arrangements.

## Sludge ---

(Continued from Page 1)

Mountain sites separately, and that access to the property will be on Route 3 in Twin Mountain, with separate processing sites in the middle of the property "so you won't even know we're there." He stated several times during the three-hour hearing that bio-solids are not toxic or hazardous, and that the levels of heavy metals and pathogens are controlled by the Environmental Protection Agency. "If the metals and toxins are at the right levels, the material can be used safely," he said.

The Planning Board had determined at a previous meeting that EPIC's plans will trigger a change in use of the formerly forested property, requiring them to apply to the Planning Board for permission to continue the project.

### The people speak

Twin Mountain resident and school board representative Leo Lavallee said that he is against the project because it will discourage tourists from visiting the area. "If we're known as the sludge capital of the world, tourists won't come," he said. "Why dump it here? Because they think we're naive and we don't have any regulations."

Ed Betz of Whitefield related the state's concerns about the town's five-acre landfill site and the stringent monitoring requirements that they impose on the town. He questioned the lack of similar regulations regarding sludge spreading, especially on such a large parcel of land as the Ingerson site. He suggested that an independent evaluation of the property be conducted. "Odor and groundwater contamination are our biggest concerns. Part of this watershed goes into the Johns River and (could have an effect) on the Robinson Farm, where the town's water supply is

eral members of the audience, including Mr. Ingerson and his son, Shawn, interrupted and challenged the speakers, but offered no concrete evidence of the project's benefits and eventually both Ingersons stormed out of the hall.

According to Mr. Holz, several additional public hearings will be held, with the dates to be announced. In the meantime, the Planning Board is working with forester, Charlie Baylies and soils scientist, Ray Lobdell to assess the proposed project and to develop a set of questions that EPIC will be required to answer.

Portsmouth Herald (N.H.) Friday, October 10,1997

# State accused of neglecting water quality

## Gets low rating from NWF

By Judy Williams
Herald Staff

PORTSMOUTH — A report from the National Wildlife Federation ranks New Hampshire among the country's worst violators of federal Clean Water Act regulations.

"I'm not surprised," said Doug Bogen, the New Hampshire program coordinator for Clean Water Action, an environmental group in Portsmouth. "New Hampshire has been in a state of denial for years concerning surface-water pollution."

The report judges each state on how well it follows regulations designed to protect waters from "non-point" sources of pollution.

Non-point sources are not easily visible and include agricultural and industrial runoff, and airborne pollutants, Bogen explained. Point-specific sources of pollution include such things as a pipe pouring sewage into a lake, he said.

New Hampshire and Massachusetts are among 19 states that received the lowest possible rating. The report not only accuses the states of failing to address pollution problems, but with ignoring the federal mandate requiring states to publish a list of polluted waters.

Maine's performance was called "poor," but the state has met the minimum requirement of preparing a list of polluted waters, the report states.

Eric Williams, a coordinator with the New Hampshire Department of Environmental Services, would not comment on the report yesterday.

The National Wildlife Federation report cites two criteria, said Kari Dolan, one of the report's authors.

First, investigators looked at whether states are keeping an inventory of waters at risk and tracking the amounts of pollutants they can safely accept. According to Dolan, states are required to inventory their waters every two years and make the results public.

Second, after the list has been created, states are required to devise plans to control pollution and keep it below a certain level.

According to Dolan, non-point source pollution has been blamed for causing toxic chemicals to seep into groundwater, and is linked to the contamination of fish.

Dolan said that New Hampshire has effective regulations in place to monitor point sources of pollution but that there is a "failure to address non-point pollution."

"In New Hampshire, polluters have a free ride," Bogen said. "There are few restrictions and fewer enforcers."

Dolan said that states need to use tools provided by the Clean Water Act more efficiently and practice greater control over pollution sources.

"The Clean Water Act has been around for 25 years," Dolan said. "I don't know how long the public should have to wait for clean rivers and lakes."

NH Water Quality

LISBON

# EPA fines Lisbon $9,000

The Courier - Apr 9 1997

By REBECCA A. BROWN
COURIER STAFF

LISBON—The U.S. Environmental Protection Agency has filed a $9,000 penalty against the town of Lisbon for failure to submit accurate and timely monitoring reports for its wastewater treatment plant.

The agency claims that since October 1995, the town failed to submit discharge monitoring data in all but two months. The two filed reports were "not fully and correctly completed," according to an EPA statement.

The agency also stated that in December of last year, it requested the town to submit the missing information, but got no response. On March 28, it issued an Administrative Order to the town to comply with its request within 14 days.

Selectman Steve Colby said this week that "miscommunication and misunderstanding" underlie the situation. He said the Board of Selectmen were unaware of the December request by the EPA, because the agency's letter was sent to Frank Clark, who had stepped down from the board. The EPA letter also went to Wade Wells, who supervises the wastewater treatment facility. But the EPA's order at the end of March came as a surprise to the selectmen, he said.

"The town was certainly not intentionally" in noncompliance, Colby said. "It was a lack of communication."

The selectmen discussed the situation at their Monday meeting. New selectman and board Chair Walter Johnson said Tuesday that all the required information, plus a letter explaining the delays, will be on their way to the EPA by the middle of this week.

"The good news is that the functioning of the system is good as far as discharge," he said. "We fell down on the reporting end, but the plant is running well. There aren't any violations of discharge regulations. But obviously there were some delinquencies of duties" regarding reporting, he said.

"We're still evaluating how we got into this," he added.

The town is considering how to respond to the $9,000 penalty. A Manchester law firm with expertise in environmental matters has been engaged, Johnson said.

EPA spokesperson Alice Kaufman said Tuesday that towns often negotiate with the agency to reduce fines, once they are in compliance.

NH Water Quality
Lisbon

MANCHESTER UNION LEADER - THURS. JULY 17, 1997

# Former Wastewater Treatment Operator Gets Suspended Sentence

**HAVERHILL** (AP) — The former wastewater treatment operator for Lisbon has received a suspended jail term and been fined $1,500 for lying about the community's river discharges.

The state attorney general's office said Wade Wells pleaded guilty to falsifying the report of last September's discharges into the Ammonoosuc River.

Wells was given a four-month suspended jail term, a $5,000 fine with all but $1,500 suspended, plus 50 hours of community service.

Assistant Attorney General Geoffrey Ransom said that instead of sampling and analyzing effluent, Wade simply made up the numbers.

Ransom said Wade became Lisbon's wastewater treatment operator in 1989. Before that he held a similar position in his hometown of Lyndonville, Vt.

HS 8/15-

NH Water Quality
Lisbon

# water supply in North Haverhill

NORTH HAVERHILL – The oath of office was issued to Barbara Dutile of North Haverhill, as she assumed her role as Selectman for the Town of Haverhill. She joins Chairman Michael Graham and Jeff Delaney on the Select Board.

contingencies, and $20,000 for CDBG administration.

Steve Patten from the North Haverhill Water & Light District, queried whether the CDBG funds could be used to upgrade the water lines in the precinct. Lane said that

French Pond Road issues

Gary Langlois, as spokesman for the French Pond Homeowners Association, explored options with the Select Board. Specifically, Langlois was seeking a one year continuance of road maintenance of French Pond Road. At the time of the French Pond Road housing project, the developer gave his word to the prospective buyers that he would pave the road, according to Langlois. However, it's been years since the project has been completed. There are approximately 18 houses in the project. The road is considered private land.

Graham told Langlois to call a landowner's meeting to gain a concensus of opinion to take steps to remedy the road situation. Graham said, "By statute, the town cannot spend money for private land," but added that he was personally leaning toward a one year extension of service.

No action was taken by the board.

Water supply in North Haverhill

A public hearing was held to investigate and hear of proposals to dig new wells for the water supply in the North Haverhill water system. The Town is requesting $350,000 in emergency funds to install new wells to service the North Haverhill water system. Tests from the spring-fed supplies have not passed the NH DES standards. The new wells are required to bring the water supply into compliance with regulations.

CDBG (Community Development Block Grant) consultant Donna Lane outlined how Haverhill could apply for these emergency funds. The $350,000 would be allocated as follows: $30,000 for Preliminary Hyrogeological investigation; $37,000 for construction of two wells; $15,000 for well testing; $5,000 for NH DES permitting; $30,000 for temporary storage tank; $15,000 for yard piping and interconnections; $100,000 for control/treatment building and access road; $10,000 for telemetry; $30,000 for engineering-design and permitting services; $30,000 for engineering-construction related; $28,000 for

the emergency funds could only be used for a new water supply; that upgrading of the water lines would have to come from non-emergency CDBG funds. These funds have stricter standards and would include an increase to $250 per year to water rates in the precinct in order to meet criteria. Rick Skarinka from the NH DES noted that pipe replacement is a chronic problem throughout the state, and that it may be a long-term investment.

Skarinka also suggested that the district could explore hooking up to the Woodsville water system.

Other business

Attachment W

# NEW HAMPSHIRE FARM BUREAU FEDERATION, INC.

295 Sheep Davis Road • Concord, New Hampshire 03301-5747 • (603) 224-1934 • Fax (603) 228-8432
www.fb.com/nhfb

April 1, 1999

**To:** Members of the Senate Environment Committee

**From:** Brenda Clemons, Director of Public Affairs
New Hampshire Farm Bureau Federation

**Re:** **SB 218**
***FB position ~ Opposed***

Thank you for the opportunity to express our concerns regarding SB 218. The New Hampshire Farm Bureau Federation is a 5,000 member family organization representing farm and rural interests throughout New Hampshire. Farm Bureau is recognized for its "grassroots" foundation of philosophy and activities. Our position are based on policy which is generated by our members and adopted by a majority vote.

***Our organization is strongly opposed to the additional restrictions on the use of biosolids embodied in SB 218.*** Farmers must return nutrients to the soil to produce crops. Nutrients cannot always be generated from on-site sources and must be supplemented by either organic materials or commercial fertilizers. Because of the proven benefits of biosolids as a fertilizer, we support the rights of farmers to choose to use these materials on **their land**. It is apparent the burdensome, costly and misdirected attempts over the past two years to regulate biosolids past the point of reason are intended to eliminate the practice rather than make it safe.

We support fair and reasonable regulations of biosolids that is necessary to ensure protection of public and environmental health. We feel strongly that current rules regarding the use of biosolids adequately protect the citizens and land of New Hampshire and again, in our opinion, feel this piece of legislation goes beyond what is reasonable and necessary to ensure environmental and human safety. It is imperative that decisions regarding biosolids use be based on scientific information and not for emotion or political reasons.

Farmers are dedicated to protecting the environment through safe, wise and regulated use of biosolids. They work closely with the NH Department of Agriculture, Markets & Foods, the University of New Hampshire Cooperative Extension and many other specialist to ensure they are using the safest most effective application practices. Biosolids, unlike commercial fertilizers, which must be purchased, are provided to farmers at no cost. This saves a farmer thousands of dollars each year which can be reinvested in the farm. Biosolids recycling is a beneficial use of one portion of a waste stream to which we all contribute.

As with all tools available for agricultural production, proper management in accordance with stringent standards based upon scientific and technical research is essential to the continued success of our agricultural operations. ***SB 218, in its entirety is of concern to us, and we respectfully urge you to find it inexpedient to legislate and let the newly revised Sludge Management Rules and the expertise of the NH-DES staff regulate the beneficial use of biosolids.*** Thank you.

Attachment X

BIO GRO
A WASTE MANAGEMENT COMPANY

2000 Forest Avenue
Portland, ME 04103
(207) 878-8177
(800) 838-8177
(207) 878-8179 Fax

April 1, 1999

The Honorable Richard L. Russman, Chair
Senate Environment Committee
Legislative Office Building, Rm. 102
Concord, NH 03301

Re: SB 218, "Regarding the Land Application of Sewage Sludge"

Dear Chairman Russman:

This letter will provide our formal comment on the proposed legislation, SB 218, "An Act Regarding the Land Application of Sewage Sludge". This legislation contains numerous provisions, which either alone, or together as the entire bill, if adopted, would end land application and the successful recycling of biosolids in New Hampshire. Bio Gro strongly opposes this bill and will address our concerns in the order in which they appear in the legislation.

1. Public Notice

SB 218 would require extensive personal notice prior to the commencement of operations for land application. This would require a letter (certified to verify mailing) to each abutter within 200' of a land application area. This provision would apply to all biosolids, even Class A products that are purchased at retail outlets. Is it the intent of the sponsors to require each homeowner to sent certified letters to their neighbors each time they purchase a bag of compost or Milorganite at Walmart?

With regard to Class B land application, this provision is unnecessary and overburdensome. First, as land application is prohibited under Env-Ws within 200' of an occupied dwelling (500' if topdressing), this provision is unnecessary. Furthermore, both RSA 485-A:5 and Env-Ws 800 contain extensive notification, both at the time of submitting an application and prior to the commencement of spreading. Notices about the activity are provided to abutters by mail at the time the permit application is submitted so that comment and information can be shared. Public notice by publication in the local newspapers and posting of land application sites provides additional notice to residents and municipalities once a permit is granted and spreading is to occur. The bill would require that a letter be sent to "other persons using commercial, institutional or residential buildings within the application area or 200 feet of the intended treatment area". As biosolids are not applied within 200' of abutting occupied dwellings, this provision is unnecessary as there would never be a building within the application area. However, even if nearby buildings were within this setback, how is an applicant going to be able to

identify "other persons using commercial, institutional or residential buildings"? Does this mean that every customer of a commercial property requires a letter of notification or every visitor to a residence?

2. Recordation of Non-Metal Sludge Use

This section would require that any biosolids which do not meet the specified standards as a "low-metal biosolids" would require that the generator file the most recent lab analysis along with a notice at the registry of deeds for the property in which the biosolids were applied. This provision would apply to both Class A products, distributed in the general stream of commerce such as Milorganite and compost, as well as Class B biosolids.

There is no scientific or technical justification to require such notification on metals content with the registry of deeds as there is no increased risk to the public health or environment from metals at land application sites. All fertilizers have varying levels of the regulated metals, some at much higher levels than biosolids. For example, mined rock phosphates contain much higher levels of cadmium that what is permitted for land application for biosolids. Shouldn't these fertilizers contain the same notification as there would potentially be a higher loading rate? Furthermore, as information about the land application site is already part of the public record at the Department of Environmental Services, there is no need for the additional notifications and filings at the registry of deeds.

3. Molybdneum Level/Metals Concentrations

There is no scientific or technical justification to legislatively mandate the quality standards for biosolids. The Department of Environmental Services in conjunction with the Bureau of Health Risk Assessment has carefully evaluated this issue and have determined that the quality standards of Env-Ws 800 is highly protective of New Hampshire's public health and environment. Establishing these levels by legislative mandate eliminates the Department's initiative to develop incentives for generators to be able to continue to work toward lowering the levels of metals in their biosolids. The metals levels mandated by this legislation would prohibit many N.H. municipalities from participating in land application or recycling programs resulting in higher management costs as alternatives options such as landfilling and incineration (out-of-state) are implemented. Furthermore, New Hampshire's farmers would lose the benefits of a safe and valued nutrient source.

4. Prohibition of Land Application on Forest Land

There is no scientific or technical justification to ban land application of biosolids on our forestland, especially when such a program would provide many benefits to our forest ecosystem. The Pacific Northwest has successfully applied biosolids on forestland and has provided many environmental benefits which has been extensively documented through the work of Dr. Charles Henry at the University of Washington. Biosolids applications in the forest provide important nutrients for improved growth and harvest yield. It also provides an improved understory which provides important habitat for wildlife. Soil quality is also improved which aids in preventing erosion and improving water quality in these areas. Several fact sheets from the Northwest Biosolids Management Association on the benefits of forest applications are attached for your information.

5. Solid Waste Restriction

This section would prohibit the use of solid waste products such as wood ash or certified waste derived products with biosolids. This would also prohibit the composting of sludge with leaf and yard wastes or food wastes which are defined as solid wastes. There are many solid waste products which are valuable feedstocks for composting operations, or to agricultural operations as a soil amendment which would no longer be permitted for use under this section. The Department has extensive regulations both under the Solid Waste Rules and the Sludge and Septage Rules providing the appropriate guidelines and management practices for these products. To eliminate these programs will add further burdens upon our landfills and solid waste management infrastructure. To promote disposal over recycling options is contrary to the waste management hierarchy established by the legislature and the recycling goals of the State.

6. Soil pH Maintenance

This section would require that the soil pH be maintained for all land application sites (including compost or other Class A products) between 6.5 and 7.0 during use of the site and for 5 years thereafter. There is very low mobility of metals from biosolids to warrant this level of pH maintenance. Metals in biosolids are not highly soluable and have very strong bonding properties with phosphorus, iron and soil particles. Field studies have clearly documented that pH is not as important as a management option for monitoring the availability or solubility of certain metals. The Department has developed highly protective quality standards and site management practices to address potential concerns about the effects of metals in biosolids in their comprehensive Env-Ws 800 regulations.

7. Minimum of 250' Setback from Water

Buffer strips and setbacks are important management tools in agricultural operations. Buffer strips as small as 10' (ten feet) can be effective filters for surface runoff, capturing both nutrients and residues from other products used in production. The Best Management Practices published by the N.H. Department of Agriculture, Markets & Food specify 20 feet as a minimum buffer for agricultural operations. A study conducted at Clemson University comparing animal manures, biosolids and commercial fertilizers and their impact on surface water due to runoff from agricultural fields found that of these fertilizer choices, biosolids had the least impact on surface water quality.

The Department has established highly protective setbacks (125'/75') which were based upon input from New Hampshire researchers and agricultural advisors. The safety of these setbacks is clearly documented by the fact that even under the former distances of (100'/50'), there has been no degradation of New Hampshire's waterways when the Department's setbacks have been followed.

8. Minimum Depth to Bedrock

This section would arbitrarily increase the minimum depth to bedrock from 2' to 3'. This would apply to both Class A products such as compost or pellets and Class B biosolids. The use of stringent quality standards and agronomic rates make biosolids a very safe and environmentally sound fertilizer or soil amendment choice. Organic fertilizers such as biosolids and animal manures are often the preferred fertilizer choice as they are a slow-release nitrogen source and not as prone to leaching as others such as commercial fertilizer. This arbitrary standard will eliminate shallower soils which may be under active cultivation or forestland from receiving the benefits of biosolids. The result will be that more leachable products will be used instead of biosolids which is contrary to the intended purpose of improving water quality.

9. Floodplain Prohibition/30 Day Field Stacking Site

This section will prohibit the use of biosolids in the floodplains. This includes both Class A and Class B products and will deprive many farmers of this highly valuable nutrient source as much of our most productive farmland is located along the floodplain. There is no scientific or technical justification for such a prohibition. In fact, this prohibition could impact ongoing research sites of the University of New Hampshire.

The second provision of this section would limit field stacking to only 30 days and on "unsaturated soil with a depth of 4' to groundwater". This would require the construction of permanent facilities in the field with an impervious layer for these 30 day stockpiles.

This would eliminate land application in New Hampshire. Farmers will not give up valuable cropland for the construction of permanent facilities all over their farm. Field stacking, especially through the winter is necessary to ensure that enough material is to meet the crop needs of the farm is delivered prior to planting. This becomes very important for spring crops such as corn where there is a short window of time for spring planting. Many generators simply do not have production capabilities to generate the all of the biosolids needed for a crop, especially on the larger farms, in a 30 day period of time. These prohibitions and arbitrary restrictions will only provide economic and operational incentives to generators to use other management options such as landfilling and incineration (out-of-state).

The Department has developed highly protective standards for field stacking sites which are consistent with the storage and management of other animal manures and should remain in effect.

10. Limiting Land Application to 8% Slopes

This provision would require that all applications be limited to slopes of no greater than 8%. There is no technical justification for such an arbitrary restriction. The effect of this section will eliminate biosolids use from many of New Hampshire's agricultural operations. Land application of biosolids on slopes of 8% - 15% pose no greater risk to the public health or environment than do the use of other manures or commercial fertilizers. In fact, studies such as the Clemson study referenced earlier, have demonstrated that biosolids are often the preferred fertilizer choice as they have the least impact to surface waters. The Department has established highly protective requirements for agricultural applications on slopes of 8% - 15% which are based upon safe and environmentally sound agricultural and conservation practices.

11. POTW Industrial Wastewater Contributors

This section is unnecessary as this information is already required under Env-Ws 800 as part of a Sludge Quality Certification application process. There is no need to legislatively mandate provisions already enacted by regulation.

12. Dioxin Standard

This section proposes to mandate a dioxin standard which has already been enacted by the Department based upon input from the Bureau of Health Risk Assessment. To arbitrarily

mandate a specific standard eliminates the Department's ability to continue to work with the Bureau on developing risk-based dioxin standards as further information and research becomes available.

13. Sludge Quality Certification

The Department requires a Sludge Quality Certification for biosolids to be land applied in the Env-Ws 800 rules. There is no need to legislatively mandate a program already developed with clear standards and definitions in the regulations. The Department has expended considerable effort into developing a clear and technically sound review process for obtaining an SQC and there is no justification for limiting their ability to administer the program as developed.

14. UNH BMPs for Land Application/Agronomic Rates

This provision mandates that UNH Cooperative Extension review each permit application and agronomic supporting documents and provide a field by field nutrient management recommendation which is inappropriate and not under their organizational mandate. Furthermore, this would restrict NRCS, Soil and Water Conservation District staff or other agricultural advisors from being able to develop agronomic recommendations, even when Class A products such as compost are used.

Farmers utilize the services of numerous agricultural advisors including, but not limited to UNH Cooperative Extension agents, NRCS (especially in the development of manure management facilities and soil conservation plans) and certified crop advisors or other agricultural advisors to develop their nutrient management plans to determine their off-farm fertilizer and soil conditioning needs. UNH Cooperative Extension does not have the sole authority to develop guidelines for nutrient management planning for individual sites using biosolids. This requirement exceeds the advisory consultant role of UNH Cooperative Extension as it transfers the administration of the development of nutrient management plans to this agency.

The Department has addressed the need for nutrient management plans and development of site specific agronomic rates in the Env-Ws 800 rules which makes this requirement unnecessary.

15. Sludge Containing Dioxin

This section requires that any sludge containing dioxin follow additional management

practices such as the prohibition of grazing as well as using the land for the crops for human consumption.

First, what is the definition of a "sludge containing dioxin". Current testing methodologies have established detection limits and either the compound is detected at a reportable level or is listed as "not detected". As proposed, this legislation would ban the use of all sludges, as there is no available testing methodology which can accurately state there is no dioxin in the sludge. Furthermore, there is no definition of PCDD and PCDF in this legislation. This vague and arbitrary language would essentially ban the land application of biosolids (both Class A and Class B) as well as other residuals.

This section places additional burdens upon subsequent landowners to provide notification that biosolids containing dioxin were used on the site. Such a provision is unnecessary, overlyburdensome and unenforceable. Furthermore, there is a substantial public record on each land application site available at the Department which makes additional notification and recordkeeping unnecessary.

The Department after careful review and input from the Bureau of Health Risk has developed a very conservative and highly protective dioxin standard. There is no justification or documented evidence that this standard is not protective of New Hampshire's public health or environment and therefore, the Department's standard should continue to stand.

16. Sludge Hauler Permits

The Department has developed an extensive hauler permit procedure which is designed to be both cost-effective and efficient to administer (both monitoring and enforcement). There is no justification to duplicate this effort through arbitrary legislation. Furthermore, this section as proposed may conflict with federal transportation laws as it appears it would apply to all haulers (both Class A and Class B), even those who simply haul through the state.

17. Wastewater Treatment Plant Prohibition on Septage

New Hampshire has very limited resources available for the treatment of its wastewater or septage. Many communities do not own or operate their own wastwater treatment plants and wastewater treatment is managed entirely by relying upon homowners to routinely pump their septic tanks. The reality is that this septage must go somewhere and the only options available are either a wastewater treatment facility for further processing (resulting

in biosolids) or to a septage land application site.

For a number of reasons, largely fueled by very emotional, but unsubstantiated claims, many New Hampshire communities have found themselves involved in the debate on how to manage biosolids, whether generated in town or not. The increase in the number of towns which have adopted highly restrictive or outright bans has resulted in an increased financial burden upon those communities with wastewater treatment facilities. These wastewater treatment plants are seeing increased requests for septage treatment, while seeing decreased availability for the most cost effective management option, land application.

The simple reality is that if a community is not providing wastewater treatment services with affordable disposal options, it should not be burdening other facilities. As all communities are suppliers of biosolids, then all communities must share in the responsibility for biosolids management, which includes land application and other recycling methods.

In conclusion, if SB 218, or any one of its provisions are passed, land application in New Hampshire will be eliminated as an environmentally sound and viable management option. Thanking you for this opportunity to provide comments, I am,

Sincerely yours,

Ann A. Bosiak

Ann A. Bosiak
Technical Services Coordinator

cc: S. Toft, B. Angelotti, J. Faust, P. Gratton, G. Lynch, D. Hufman, Bio Gro
H. Veilleux, S&H Murphy

a:\work15\sb218.ltr

Attachment X (cont.)

## SB 218: REGULATING THE LAND APPLICATION OF SEWAGE SLUDGE

**In Effect, SB 218 is a BAN on Biosolids Recycling**

SB 218 effectively places ***a ban*** on the land application of sewage sludge programs that have been used over the past 25 years in New Hampshire to the benefit of citizens and municipalities seeking to recycle as the most cost-effective way of managing biosolids and by farmers and landowners who benefit because biosolids are a free soil amendment and fertilizer.

Bans deprive farmers and landowners the option of using a fertilizer that is sanctioned by the US EPA, agricultural organizations, and NH DES. Moreover, a ban will be a significant cost driver to those cities and towns that select to recycle biosolids over incineration or landfill dumping.

**Let the Rules Work!**

In March, DES formally adopted rules (Env-Ws 800) governing sludge, including land application of sewage sludge. In combination with federal EPA regulations (40 CFR Part 503), these rules include new requirements for notification, new permitting conditions for sludge haulers, site suitability, management practices, sludge quality certification, and groundwater monitoring, among other restrictive conditions.

DES conducted 2 formal public hearings, multiple stakeholder meetings and received significant input from all interested parties. The end result is that these rules are protective of public health and the environment and backed up by decades of research. We ask that you give these rules a chance to work and not dismantle them as would result in passage of SB 218.

**Unfunded Mandate?**

If SB 218 is enacted into law, the resulting costs to municipalities will be in violation of NH Constitution, Part 1, Article 28-a that protects municipalities from unfunded state mandates. Currently, 8 cities or towns routinely land apply Class B sludge, for cost avoidance purposes, including Hanover, Concord, Hampton, Hooksett, Seabrook, Suncook, Franklin and Littleton.

**Ban on Recycling Inconsistent with Current Law**

Requiring wastewater treatment facilities to accept septage from other towns that may have a ban on recycling biosolids is a policy inconsistent with existing statute. RSA 486:13, Disposal of Septage, requires all towns to provide an outlet for their septage and to address the proper disposal of septage as part of the solid waste disposal responsibilities.

Today, over 65 cities and towns in New Hampshire transport their septage waste to the Lowell Regional Wastewater Utility in Lowell, Mass., accounting for approximately one quarter (2.1 million gallons) of all septage received at the Lowell facility. This represents a 57% increase over 1997 figures.

**SB 218 Lacks Scientific Basis**

SB 218, as written, is vague, ambiguous and provides no discernable scientific basis for added restrictions. DES is also concerned about some of the language contained in SB 218, stating that "SB 218 is subject to broad interpretation or impractical, and consequently, is either not implementable or subject to future challenge."

**Requiring Landowners to Record in Registry of Deeds is Unreasonable**

Requiring landowners to record the use of "non-low metal sludge" in the Registry of Deeds is unreasonable and serves no purpose whatsoever. This is especially true considering that other materials, such as commercial fertilizers, manures, herbicides and pesticides are not also required to be registered.

**New Hampshire *IS NOT* Sludge Dumping Ground**

Proponents of SB 218 claim that New Hampshire has become the sludge dumping ground for New England. This is simply not true. DES has publicly stated that New Hampshire is not a net-importer of sludge.

The new rules address any concern that if the sludge is not generated in New Hampshire, certification that the sludge must meet the chemical standards for land application in the state of origin. This means that out-of-state sludge has to meet New Hampshire's and the sending state's requirements, whichever is more stringent.

**Who Opposes SB 218?**

The following organizations have concluded that properly-managed biosolids land application programs that comply with all federal and state regulations are acceptable in NH, and therefore, are opposed to SB 218:

Business & Industry Association of NH
NH Water Pollution Control Association
NH Department of Environmental Services
NH Farm Bureau Federation
Resource Management Institute
American Forest & Paper Association
NE Biosolids Recycling Association
NH Municipal Association

**Vote SB 218 as Inexpedient to Legislate**

In light of the beneficial uses of sludge, the newly revised Sludge Management Rules, and the highly technical staff at DES to regulate biosolids, we urge you to vote "Inexpedient to Legislate" on SB 218. If SB 218 is passed, the total effect of the proposed conditions will effectively be a ban of the land application of sludge, which does not appear to be the legislative intent.

Attachment Y

CITIZENS
FOR A
FUTURE NEW HAMPSHIRE
PO BOX 38
N. SANDWICH, NH 03259

SB 218

Senator Pignatelli

## Additional Supporting Documents:

485-A:5-d II Protecting Human Health and Live Stock:

A-1 Editorial by Jack Anderson
A-2 Comments on molybdenum by soil scientist M. McBride
A-3 Page 6 of UNH Sludge Task Force Report
A-4 NH Bureau of Health Risk Assessment Recommendations for Meal Concentrations in sludge.

485-A:5-d IV Protecting Aquifers. Restricting Sludge Application on Spent Gravel Pits.

B-1 NEBRA preliminary report indicating nitrate leaching
B-2 DES letter discussing leaching of industrial chemicals from paper mill sludge stockpiles.
B-3 Abstracts from recent studies on metal mobility and solubility in sludge.
B-4 Page 27 of EPA guidelines with respect to protecting potable ground water at reclamation sites.
B-5 Carson testimony on reclaiming pits without using sludge or topsoil.
B-6 Response to Industry Testimony on gravel pit reclamation.
B-7 New data on arsenic in drinking water

485: A:5-e II Protecting Human Health. Lower Metal and Dioxin Limits:
A-4
A-2
B-3
B-7

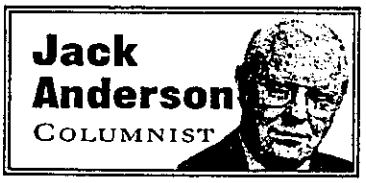
485:A:5-d IX Protecting Human Health and Surface Water. Pathogens and Stockpiles.

C-1 Recommendation to DES by Gove Environmental Services prohibiting sludge on flood plains.
C-2 Alice Minter Trust Farm—Bacterial Food Poisoning
C-3 The Death of Shayne Conner: Statement by EPA microbiologist David Lewis and statement by NH resident Joanne Marshall.

A-1

# Govt. Fails to Regulate Sludge Dumping

WASHINGTON




Like many places in the late 1970s, the city of Augusta, Ga., had a problem: millions of gallons of sewage sludge and nowhere to put it. And like many cities, Augusta turned to the easiest, cheapest solution: spreading it on farmland.

Augusta city officials targeted two dairy farmers, R.A. McElmurray, Sr. and Hugh Boyce, for sludge dumping.

Like all sludge, the Augusta variety was produced by running whatever was dumped into the city's sewer through a series of settling pools and chemical treatments. The treated water is discharged, leaving a highly concentrated sludge of industrial byproducts and human waste that has creatively been labeled "biosolids."

The dairymen accepted vast quantities of "biosolids." McElmurray took more than 71 million gallons through 1990, and Boyce took 23.4 million.

Around 1986 both McElmurray's and Boyce's farm managers began noticing some disturbing things: the leaves on their feed crops were twisted and the roots weren't forming properly. Their cattle were losing weight, giving less milk and their mortality rates were slowly rising.

After carefully eliminating a range of possibilities, McElmurray attributed the farm's problems to the sludge and canceled his sludge contract in mid-1990. But city officials didn't miss a beat. They brazenly tripled the amount of sludge they dumped on Boyce's property while they scrambled to secure new dumping grounds.

By 1993 Boyce's herd and land were being ravaged. Mortality rates had quadrupled from 1980 and annual milk production had dropped significantly. Things continued to spiral downward as herd managers ruled out one possible cause after another. By early 1998 the herd's mortality rate was approaching 30 percent. Finally, Boyce canceled his sludge contract.

Soil samples from McElmurray's and Boyce's farm support what the dairymen had already concluded: the city's sludge was toxic, laden with high concentrations of heavy metals, volatile organics and petroleum byproducts.

Boyce and McElmurray have filed a suit against the city in federal district court. When we asked Augusta city officials to respond to the allegations, we were told "our comment is no comment."

A growing number of anti-sludge activists say stories like Boyce's and McElmurray's are evidence that the spreading of sewage sludge is nothing but a way for government officials to escape liability for a highly concentrated toxic waste.

Former chemistry professor Stanford Tackett describes sludge spreading as "a scam of enormous proportions, driven mainly by money."

The greatest danger of sludge dumping, experts say, is that no one really knows what's in it. Among the more disturbing facts uncovered by the Augusta lawsuit is that the city was allowing extensive after-hours dumping. In a Feb. 13, 1995 memo, the city's director of Water Pollution Control acknowledges that "currently haulers who dump after normal business hours are on the honor system, and we have no control over what might be introduced to our plant."

Pat Costner, who owned and operated a small wastewater analysis lab before taking her current job with Greenpeace, told our associate Ashley Baker that "very few industries know what's in their discharge. They will know fairly broad parameters, but they won't know every chemical that's in there. If a city has a pretreatment program, it will only address a fairly limited number of chemicals."

*Former chemistry professor Stanford Tackett describes sludge spreading as "a scam of enormous proportions, driven mainly by money."*

Another problem is that government agencies require relatively few companies to treat their waste before sending it down the drain. The New York City Department of Environmental Protection, reported that as of March 1994, there were 93,900 establishments of "possible concern" dumping dangerous and toxic substances down the drain. But in the end, the Department identified only 1,141 that "needed regulation."

Even regulated companies are suspect. A 1993 EPA report found that 54 percent of the 30,000 industrial users nationwide were in "significant non-compliance with pretreatment limits or reporting requirements, or both."

But rather than cracking down on such practices, the EPA has orchestrated and funded a massive public relations program to "educate the public" about the "beneficial uses" of sludge.

We were surprised to learn that the EPA's top sludge regulator, Alan Rubin, had been loaned to the Water Environment Federation, the sludge industry's lobbying and public relations arm in 1995 while EPA continued to pay half his salary.

Rubin's response to our questions about the dangers of sludge was predictable. "In all of the years I have worked on this, I've never seen a documented case (facts are gathered, report is written and peer reviewed by qualified scientist) of a human getting sick from or a animal dying from biosolids or exposure to biosolids."

Does this sort of narrow answer remind you of anything else going on in Washington right now?

*Jack Anderson is a syndicated columnist*

A-2

*Comments on New Hampshire DES proposed sludge management rules:*

*M.B. McBride, Cornell University*

This draft proposes soil concentration limits of potentially toxic trace metals that are 1/2 the values obtained from a risk assessment. However, field research has shown in numerous locations that soils containing near or below the proposed limits (7 mg/kg for Cd, 750 for Cu, 1000 for Zn, etc.) are not able to grow a wide range of crops. This has been demonstrated repeatedly on long-term sludge experiments in Britain, Germany and Scandinavia, and we have seen similar toxicities at Cornell in sensitive crops such as soybeans and red clover. Furthermore, without very careful attention to keeping pH near 7, the cadmium concentration limit of 7 mg/kg allows high cadmium uptake into certain crops such as leafy vegetables, as Dr. Steve McGrath has repeatedly demonstrated on long-term sludge field experiments in Britain. I can only conclude that the DES risk assessment is badly flawed. If risk assessment, which is a model of reality, is inconsistent with direct observation, some of the assumptions in the assessment must be wrong.

I would like to comment further on the molybdenum and selenium soil concentration limits of 17.5 and 14 mg/kg, respectively. Both of these levels in soil would be dangerous for farm animals that are grazing or fed forage from such soils. The research literature, and our own work at Cornell, shows that molybdenum in alkaline sludge products applied to soils is very plant-available, and we would expect much the same for selenium,. We have a soil containing 3.5 mg/kg Mo (background is near 1.0 mg/kg Mo in soil of this area) as a result of sludge application in 1978. Red clover grown on this soil has elevated Mo in the leaves, sufficient to induce the disease of molybdenosis in cattle. I have concluded that total Mo applications on pastures and forages should probably not exceed 1 pound per acre, and this may still be too high on certain soils. Obviously, 17.5 mg/kg Mo is not a reasonable level of Mo to permit on dairy and other animal farms.

There is a large data base of research to support much lower selenium and molybdenum limits in soils, based on experience in regions where natural soil Mo and Se is high and causes disease in animals. Forages containing 10 mg/kg Se can cause reduced reproductive performance in farm animals. Higher concentrations cause outright selenium toxicity in the animal. Since these effects have been observed in soils containing as little as 2 mg/kg total Se, the 14 mg/kg limit is not protective.

There are many references I can refer you to on these subjects, if documentation is needed.

- Groundwater monitoring of field corn sites with biosolids as the nitrogen source - Research at UNH has involved four monitoring protocols: PSNT, lysimeters, deep soil cores (4'), and small-diameter wells for ground water sampling. Research findings from field data indicate a slow release of nitrogen from biosolids, which may translate to fall losses of nitrate to groundwater following corn harvest. Soil pH levels will ultimately be a limiting factor in total cumulative loading. Continued research must be conducted to fine tune nutrient recommendations and ensure groundwater is protected from leaching. - Dr. George Estes, Mr. Thomas Buob

- Assessing biosolids mixes with differing nitrogen loading rates and carbon to nitrogen ratios on reclamation sites to determine potential leaching of nutrients and effects on the establishment of sod cover. Dr. George Estes, Mr. Thomas Buob

- Study of the willingness to pay (by state residents and farmers) to have sludge hauled out of the community, and how much residents would need to be paid to accept "outside" sludge, as well as factors which affect these values. - Dr. Bruce Linsay

## Areas Needing More Answers/Research -

### Human and Animal Health

Contaminants and pathogens found in sludge are known to cause disease in humans and animals. In the 503 Rule, EPA does not regulate any organic contaminants or radioactivity. Detergent surfactants are thought to possess estrogen mimicking properties that may be detrimental to human and animal health. Lead is both extremely toxic and cumulative in children. The Center for Disease Control considers blood lead levels in children greater than 10 ug/dl toxic.

Nutritional imbalances in energy, protein, calcium/phosphorus, and trace minerals (particularly copper, zinc, cadmium, and molybdenum) have been implicated in developmental orthopedic disease in growing horses. Ruminant animals are susceptible to molybdenum toxicity (induced copper deficiency) when trace minerals either exceed recommended levels or are imbalanced in their feeds. Cadmium toxicosis is also suspected of inducing copper deficiency in both cattle and horses and has recently been implicated in causing grass tetany in cattle.

Certain metals can be particularly toxic to animals (and humans) , notably lead, cadmium and mercury but other metals such as arsenic, selenium, molybdenum, silver, boron and thallium can also cause problems. Because sludge typically contains these metals, there is concern among some scientists about the potential effect that even relatively low levels might have on the health of animals. There is also the potential for other contaminants such as PCBs and dioxins and pesticides to accumulate in animals tissues (meat) and milk. EPA imposes a 30 day restriction on grazing after application of Class B sludge (Class A is not restricted). However, the National Research Council has recommended that EPA should re-evaluate the adequacy of the 30-day waiting period following the application of Class B sludge to pastures used for grazing animals and has suggested an 18 month restriction on grazing.

Denmark, Sweden and Norway do not allow application of any sludges to any land used for grazing. The UNH Cooperative Extension publication, "Best Management Practices: Biosolids", recommends a 45 day minimum period between application and harvest or grazing. The UNHCE BMP's also recommend that forage analysis be used when application has taken place for several years. However, there appears to be a need for greater sampling and testing of forages and animals to determine the long term affects of sludge. The pollutant impact on the health of wildlife grazing unrestricted on sludged land and their potential for entering the human food chain and affecting human health is not well known.

A-4

STATE OF NEW HAMPSHIRE
DEPARTMENT OF HEALTH AND HUMAN SERVICES
OFFICE OF HEALTH MANAGEMENT
*PUBLIC HEALTH SERVICES*

Terry L. Morton
Commissioner

Jeffrey B. Schaub
Director

6 HAZEN DRIVE, CONCORD, NH 03301-6527
603-271-4664 1-800-852-3345, Ext. 4664 TDD Access: 1-800-735-2964

# Land Application of Sewage Sludge and Public Health

**What has the Bureau of Health Risk Assessment done to protect public health?**

The Bureau of Health Risk Assessment (BHRA) reviewed the basis for the Federal metals concentration limits. BHRA supports the science conducted by Federal agencies like the EPA and USDA, but decided to be more protective by recommending lower limits than Federal law requires for three metals: arsenic, cadmium, and mercury. These lower limits were suggested to the New Hampshire Department of Environmental Services (NHDES) to provide a greater margin of safety against possible public health impact from long-term exposure to metals in land applied biosolids.

BHRA recommends the following metals concentration limits for incorporation into State laws regulating sludges intended for land application:

The arsenic limit be lowered to a level within range of background soil concentrations in New Hampshire.

The cadmium limit be lowered to 14 mg/kg.

The mercury limit be lowered to 11/ mg/kg.

Sites of land application be monitored periodically for metals buildup in soil.

The maximum metals limits (ceiling concentration) allowed in biosolids be set to the 99$^{th}$ percentile of levels in New Hampshire sludges.

BHRA continues to work to protect public health by monitoring the levels of metals and organic chemicals in biosolids. BHRA is working with state and federal agencies, industry, local governments and citizen groups to address issues and concerns surrounding the public health impact of biosolids land application.

**For more information contact:**

New Hampshire Department of Health and Human Services
Bureau of Health Risk Assessment
(603) 271-4664
(800) 852-3345 Ext. 4664 (toll free in NH)

B-1

**Subject: NEW ENGLAND BIOSOLIDS & RESIDUALS ASSOCIATION**
**Date:** Sun, 10 Jan 1999 10:04:47 -0500
**From:** Helane Shields <hshields@worldpath.net>
**To:** NED BEECHER <ned.beecher@rscs.net>

Re: NEBRA Progress Report, May 1997 - July 1998 - Monitoring Demonstration at Gravel Pit Reclamation Sites in New Hampshire

Hi, Ned .... thank you for sending me the preliminary report on the above project going on at 3 sites: (1) Ambrose pit in New Hampton .... (2) Letarte pit in Tamworth ..... and (3) Martins Ferry pit in Hooksett.

I have some questions:

(1) Regarding Ambrose pit/New Hampton. I note all the nitrate concentrations at this site were in the range of 1 -13 ppm for the period June 1997 - April 3, 1998. However, since no sewage or paper mill sludge was landspread at this location during that time period, of what significance are these water test results?

Sewage sludge and paper mill sludge were spread in the Ambrose pit from spring 1998 through fall 1998. Was water monitoring done during this period? If so, who has custody of the results?

What was the application rate (in wet tons per acre) of sewage sludge and paper mill sludge spread at this site during 1998?

Was the Town of New Hampton notified that sewage sludge from Lowell, Massachusetts was spread at this site in 1998 ?

(2) Regarding the Letarte pit in Tamworth ...the test results indicate that after paper mill sludge was spread in September 1997 that the nitrate concentrations
spiked up to 30 - 113 parts per million in November 1997

The 1997 sludge list prepared by the NH DES indicates only 425 wet tons of paper mill sludge were spread at this Tamworth site in that year. Please advise the per acre application rate (in wet tons) at the "demonstration plot"..

(3) Martin's Ferry pit, Hooksett. 1997 DES sludge list indicates only 245 wet tons of Hooksett sewage sludge were spread at this location in 1997. And yet nitrate concentrations in groundwater were in the 200 - 400 ppm range in August and September 1997 -- with spikes up to 1100 ppm and 1600 ppm.

Please advise the application rate in 1997 -- wet tons per acre - at this location.

Since the regulatory limit for nitrates in drinking water is 10 ppm (mg/L), it would appear the landspreading of both paper mill sludge and sewage sludge are having significant adverse impact on groundwater at sludge spreading sites.

What is also disturbing is the fact that ONLY nitrates are being tested for ...
so there is no information on what OTHER substances are also reaching groundwater, ( IN ADDITION TO THE NITRATES), including pathogens, viruses, metals and toxic organics.

We already know toxic organics including acetone and methyl ethyl

ketone have been detected in groundwater at papermill sludge sites, including Pelham, Loudon and Tamworth ...although reportedly not over ambient groundwater quality standard in Loudon and Tamworth.

It would appear this water monitoring project was done only at sites with very low application rates. (or in the case of New Hampton -- with NO application!)

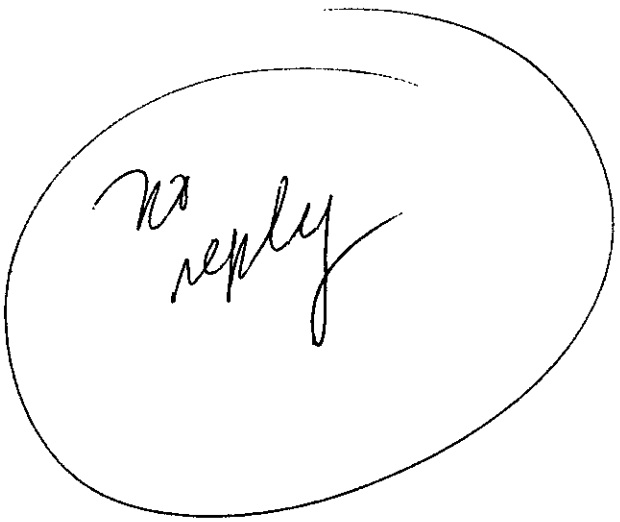
Of what significance is this "monitoring demonstration" to NH DES/waste industry policies and practices of applying a combination of sewage and paper mill sludge at rates of 500 to 1000 tons per acre? Why wasn't any monitoring done at those sites with very high application rates?

I will look forward to receiving your clarifications. Thanks again for sending the report. Helane

as of 3/7/99
no reply

**Subject:** NEBRA WATER MONITORING DEMONSTRATION (3 SITES)
**Date:** Sun, 10 Jan 1999 13:07:39 -0500
**From:** Helane Shields <hshields@worldpath.net>

Hi, Ned .... one more question ..... I cannot find anything in the report about residuals being spread at the Letarte pit in Tamworth in 1998. Please clarify ... as something must have caused that nitrate spike up to about 80 ppm in November, 1998.
helane



**Subject: Preliminary ground water study**
**Date:** Sun, 10 Jan 1999 11:15:34 -0500
**From:** "Caroline G. Snyder" <cgsnyder@post.harvard.edu>
**To:** Ned Beecher <ned.beecher@rscs.net>

Ned:

Thanks for mailing me the preliminary report on ground water quality at three reclamation sites. Since leaching occurs after heavy rainfalls, I was surprised that almost no monitoring was done during the heavy rain falls and flooding during the spring of 1998. That would have been the ideal time for monitoring, especially since these flooding and rain events are occurring much more frequently than in the past.

Although your report is very incomplete, the data does not appear to support gravel pit reclamation , especially not at high application rates. Can we see more of this study than just the NEBRA summary?

Thanks,
Caroline

--
Caroline G. Snyder cgsnyder@post.harvard.edu

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603) 271-2900 FAX (603) 271-2456

B-2

January 19, 1998

Marc Morin, P.E.
Costello, Lomasney & deNapoli, Inc.
540 Commercial Street
Manchester, NH 03101-1106

**Subject: The Revised Submittal Proposal for the Use of BFI Short Paper Fiber (SPF) Sludge as Part of a BFI Bio Mix Soil as a Loam Substitute at the Manchester Dunbarton Road Landfill Phase I Closure Construction Project. (Ref. WMD Log# 199700566, 11/6/97).**

Dear Mr. Morin:

The Department of Environmental Services - Waste Management Division (WMD) has received your transmittal with the Revised Submittal for use of BFI BioMix Soil as a loam substitute at the Subject Manchester Landfill Phase I Closure Project. My purpose in writing is to officially inform you that the WMD does not have enough information at this time to approve the use of a BFI BioMix Soil which includes earthen materials and short paper fiber (SPF). The presence of high concentrations of several volatile organic compounds (VOCs), such as acetone and methyl ethyl ketone (MEK), were recently detected in SPF samples, surface water samples and groundwater samples collected at the Roketenetz Landfill in located Pelham, New Hampshire and has caused the Department to look more closely at the quality of SPF and reevaluate our policies regarding its use at landfill closures. However, we have outlined below a suggested Quality Control/Quality Assurance (QA/QC) program that may provide the necessary data and stockpiling and mixing procedures for us to reconsider the use of SPF in landfill closure projects in the future. We will continue to review, and if appropriate, approve the use of BFI BioMix Soil whose "recipe" does not include SPF.

As stated above, we will reconsider the use of SPF in a BioMix Soil if the following information is submitted:

1. Analytical Data on SPF Sources(Pulp&Paper Industry Source) and the BioMix Product Separately.

Analytical data and all other requested information must be submitted for each pulp & paper industry source to include:

a) The results of testing three samples collected during one week (as recent as possible) for Volatile Organic Compounds (VOC's) and Metals. Both solids and pore water are to be tested for each sample. If SPF sludge is stockpiled at the source then a representative sample of the stockpiled SPF sludge should also be obtained and analyzed as above.

b) All previous test data on the SPF sludge for the past year. The results for total solids should be based on a dry weight/weight analysis.

c) The identification of any "historic" problems with acetone and MEK or other organic chemical compounds. Also, state any actions taken to identify and eliminate the source of any contaminants.

d) If the SPF at the source was used to produce BFI BioMix also submit all post-production testing performed.

e) Samples of the final BioMix product(by each source, if possible).

A scope of work for a site/source-specific Sampling Plan for collecting the necessary SPF-Source analytical data must also be submitted and approved by WMD. The scope of work should list the potential SPF sources, summarize the specific analytical methods (for VOCs, metals and semi-volatile organic compounds) to be used, describe the method to collect the "representative samples" of the source SPF sludge and pore water and specify how many BioMix samples will be collected. The SPF-Source analytical data package should include recent, and if available, historic sampling results for the SPF, pore water and BioMix.

2. Groundwater Monitoring Near Stockpile Areas.

The BioMix submittal must identify processing locations and areas where stockpiles of SPF will occur. A groundwater/surface water monitoring plan for these areas must be submitted and approved by WMD. If processing takes place on the landfill, the existing groundwater management permit must be modified to include surface water sampling from areas containing the BioMix material, but no additional groundwater monitoring wells are needed. Any future proposal to use BioMix must ensure that there will be no releases of VOCs or other contaminants above AGQS and there is no adverse impact on surface water quality.

3. Best Management Practices For SPF Stockpiles

The management of SPF stockpiling and BioMix mixing/processing areas must include the submittal and approval of a detailed QA/QA Plan (See item #4) and a Best Management Practices (BMP) Plan which addresses the following criteria:

(a) The construction of a mix pad at least 12-inches thick and having a hydraulic conductivity no greater than 10(-5) cm/sec which will completely under lie *all* stockpiling and mixing activities *and* include a containment berm to capture all free-liquids and run-on/run-off from precipitation. The BMP Plan should also address the removal and disposal of any liquids collected within the berm during the active stockpiling and mixing period; and identify the specific disposal facility for the liquids.

(b) The BMP Plan should also include a limit on the height, volume and duration that SPF will be stockpiled.

(c) The BMP Plan should address the construction of stockpiles and measures to be used to prevent equipment compaction and dewatering of the SPF stockpiles.

(d) The BMP Plan should also address the final disposition of the "mixing pad". If the pad materials are to remain on-site then this material should undergo the same QA/QC analytical standard, prior to placement on the landfill , as the final BioMix product.

Most of the items to be included in the BMPs are contained in the December 5, 1997, letter from Jasen Stock, BFI Senior Project Manager to John Regan of WMD

4. Quality Assurance/Quality Control(QA/QC) Plan for SPF/BioMix Processing.

A plan for continuous monitoring must be submitted to ensure that the quality of the SPF and BioMix continues to be acceptable during processing. The plan must include sampling frequency and parameters, laboratory turnaround times, a system of reporting to WMD for approval prior to placement

of materials on the landfill and a contingency plan to describe what actions will be taken if elevated concentrations of contaminants are detected. The QA/QC plan must include the analysis of solid and pore water samples from each source and solid samples of the BioMix mixture. Given the variability in VOC concentrations presented to date, the proposal to collect samples every 5,000 $yd^3$ of material used is not adequate. The Department reserves judgement on an appropriate frequency until the results of the follow-up sampling of the mills is submitted to the Department for review. The QA/QC plan for the SPF is expected to vary depending on how each source handles their SPF (e.g. periodic excavation of wastewater lagoons or "batch" generation using filter presses). In any event, the SPF/BioMix Processing QA/QC Plan must adequately characterize the quality of SPF being received on-site from the source industries.

I trust this letter clearly addresses our position, however please contact me or Michael Sills, Ph.D., P.E., the Division Chief Engineer if you have any questions relative to our agency's position on the use of BFI's SPF sludge in the Manchester Dunbarton Road Landfill Closure Project.

Sincerely,

Philip J. O'Brien, Ph.D.
Director
Waste Management Division

PJO\lacy:g:\share\mss\letters\manchester\dbfi4.wpd

cc: Michael Sills, P.E., Ph.D., NHDES-WMD-Chief Engineer
Richard Reed, NHDES-WMD-SWMB
Carl Woodbury, NHDES-WMD-SWMB
Michael Guilfoy, P.E./Michael Juranty, P.E., NHDES-WMD-PADRS
Michael Rainey/George Berlandi, NHDES-WD-SWQB
John Regan/Rebecca Lawrence, NHDES-WMD-HWRB
George McMenamin, P.E., WD-WEB/SRF Section
Jake Parent, P.E., WD-WEB/Construction Engineering Section
Kevin Sheppard, P.E., Deputy Director, Manchester DPW
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Jasen Stock, BFI
Gary Garfield, Dames and Moore
City of Manchester File/DB

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- **WHY GUIDELINES FOR BENEFICIAL USE OF SLUDGES IN AGRICULTURE ARE DIFFERENT AND ESTIMATES OF ALTERNATIVES**

D. R. Bouldin. 1997. Soil Science Society of North Carolina Proceedings. Vol 40 .

**ABSTRACT**

The metals zinc and copper, among others elements, are essential to plant and animal life yet depress crop yields if added in excess. Maximum cumulative loads are estimates of the amount of a metal at which the depression in crop yields become unacceptable. The implications of such a limit is that a) the effects of previous additions persist and are additive to current applications and b) if cumulative additions lead to yield reductions, these yield reductions may persist even if additions of metals via sludges are stopped.

Maximum cumulative loads of metals from application of sewage sludges to agricultural land differ by an order of magnitude among groups developing them. All use the same data yet arrive at different end points. In the following discussion the reasons for these differences are illustrated and several examples of alternative risk-based maximum cumulative loads are derived. As the probability of yield reductions approach zero, the maximum cumulative loads are 10 to 100 times less than the EPA 503 cumulative loads. These alternatives give farmers and others a perspective on how to develop a maximum cumulative load for their own situation if they are planning to landspread sludges and products containing sludges.

Full Text

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- **MOVEMENT OF HEAVY METALS THROUGH UNDISTURBED AND HOMOGENIZED SOIL COLUMNS**

Vincent J. Camobreco, Brian K. Richards, Tammo S. Steenhuis, John H. Peverly, and Murray B. McBride. 1996. Soil Science. 161:740-750.

**ABSTRACT**

When sewage sludge is applied to land for disposal or intended beneficial use, heavy metals accumulate in the soil. Because of the concern about the environmental danger that these

sludge-borne metals could represent if mobilized, many studies have been undertaken in an attempt to clarify the different factors that contribute to metal solubility, plant uptake, and leachability. The objectives of this study were to determine if two independent factors-soluble organic chelators and preferential flow paths-enhance metal mobility through soil.

Dilute solutions containing CdC12, ZnC12, CuCl2, and Pb(NO3)2 were applied to soil columns with a rainmaker, and leachate metals and chloride concentrations were measured. For four columns, the input metal concentrations (mg L-') were 7.25 Cd, 4.55 Zn, 3.51 Cu, and 13.85 Pb. In four other columns, the solution also contained dissolved organic matter so that the metals were organically complexed, and input metal concentrations (mg L-') were 6.30 Cd, 4.11 Zn, 3.19 Cu, and 12.55 Pb. For each treatment, two of the four soil columns were undisturbed and two were constructed from homogenized soils. The rate of continuous solution application was approximately 3 cm/day.

The undisturbed soil columns treated with organically complexed metals had peak effluent concentrations, expressed as percent of influent, of 30, 26, 28, and 27% for Cd, Zn, Cu, and Pb, respectively. Peak effluent concentrations for undisturbed columns treated with metals in water were 30 and 23% of influent concentrations for Cd and Zn, but only 15 and 12% for Cu and Pb, respectively. However, the four homogenized soil columns retained all added metals, whether the metals were added in water or as organic complexes. The results indicate that previous laboratory metal leaching studies performed on homogeneous soils might have greatly underestimated metal mobility in the field and that preferential flow, both alone and in combination with organic-facilitated transport, can accelerate metal leaching through soils.

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- **EFFECT OF PROCESSING MODE ON TRACE ELEMENTS IN DEWATERED SLUDGE PRODUCTS**

Brian K. Richards, John H. Peverly, Tammo S. Steenhuis, and Barry N. Liebowitz. 1997. Journal of Environmental Quality. 26:782-788.

## ABSTRACT

Minimization of the concentration and mobility of trace metals is a primary concern when considering the land application of wastewater sludges. The effects of pelletization/drying, composting, incineration, and N-Viro chemical stabilization on composition and mobility of trace metals and P were compared. One day's production of dewatered digested sludge (Syracuse, NY) was used as the sole feedstock so that observed differences would solely be a result of the process used. Mobility was determined using the toxic characteristic leaching procedure (TCLP). Analyte concentrations were essentially constant during dewatered sludge production with mean values (mg kg-l TS) of 5.6 Cd, 10.7 Co, 130 Cr, 587 Cu, 49.7 Mo, 35.8 Ni, 26 880 P, 132 Pb, and 545 Zn. Concentrations in pellets were similar to dewatered sludge, but were reduced in composted sludge and N-Viro product by the addition of amendments. Incineration concentrated all analytes except Cd and Pb, which experienced volatilization losses. The mode of processing had widely ranging effects on mobilities. The TCLP-mobile fraction (percent of total) of analytes in dewatered sludge was

<3% except Ni (7.1%), P (6.0%), and Zn (11.2%). Composting slightly increased Cd mobility, but reduced that of Ni and P. Pelletization increased the mobility of Cd (7.9%), Cu (3.8%), Ni (15.4%), and Zn (15%). The N-Viro process substantially increased mobilities of Cu (43%), Mo (50%), and Ni (24%) at elevated pH. Incineration increased mobilities of Cd and Mo, but reduced Ni, P, and Zn mobility. These results, with those of longer term in situ studies, can be used to guide the selection of sludge processes that minimize potential metal and P mobility.

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- **MOBILITY AND SOLUBILITY OF TOXIC METALS AND NUTRIENTS IN SOIL FIFTEEN YEARS AFTER SLUDGE APPLICATION**

Murray B. McBride, Brian K. Richards, Tammo S. Steenhuis, John J. Russo, and Sebastien Sauve. 1997. Soil Science. 162:487-500.

## ABSTRACT

The increased use of sewage sludge as a fertilizer, combined with reports that large fractions of sludge-borne heavy metals cannot be accounted for several years after land application, indicates that more detailed study of potential mobility of these metals in soils is needed. A field site that had received a single heavy application of municipal sewage sludge was re-investigated 15 years later to measure the degree to which toxic heavy metals as well as nutrient elements remained in the topsoil. Total elemental composition of soil samples collected recently at this site was measured by inductively coupled plasma (ICP) spectrometry analysis of acid digests as well as by neutron activation analysis (NAA). These two methods gave comparable results for most sludge-applied heavy metals, but not for those elements that reside largely in mineral lattice structures resistant to acid digestion.

Based on elemental deficits calculated using soil chromium concentration as an indicator of the original sludge concentration in the soil, it is estimated that most of the sludge-applied Na, S, Ca, and Sr, about 40% of the Zn and Cu, and less than 30% of the Cd and P have been lost from the topsoil. There is limited evidence that about half of other heavy metals such as Hg, Ag, and Au has also been lost. The ICP analysis of water extracts of the soils shows present concentrations of water-soluble Cu, Zn, and Ni in the sludge-amended topsoil are more than 10 times higher than those in the control soil. Ion-selective electrode measurements confirm that a large fraction of soluble Cu appears to be in an organically complexed and mobile form, which leaches to shallow groundwater. To varying degrees, numerous other elements, including Cd, P, and S, have solubilities substantially higher than in the control soil after the 15-year period. Nevertheless, despite the fact that the elemental deficits are correlated to the distribution coefficients of the elements, the deficits can only be accounted for by leaching if those elements were more soluble in the soil immediately after sludge application than they are now. The Zn and Cd remaining in the topsoil (pH 6.5-7.0) after 15 years is plant-available, as indicated by excess uptake and severe phytotoxicity symptoms in vegetable crops.

In summary, although the vertical metal concentration profiles failed to manifest substantial movement of most trace metals, it appears that large fractions of certain metals applied in the sludge amendment have redistributed and moved out of the soil surface by physical-chemical or biological processes and that there is potential for groundwater and surface water

contamination.

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- **USE OF SLUDGES IN AGRICULTURE AND RISK OF REDUCTION OF CROP YIELDS**

D. R. Bouldin. Soil, Crop, and Atmospheric Sciences. Cornell University.

**ABSTRACT**

The metals zinc and copper, among others elements, are essential to plant and animal life yet depress crop yields if added in excess. Maximum cumulative loads are estimates of the cumulative amount of a metal that cause an unacceptable risk of crop yield reduction (where cumulative load is the sum of all past metal additions). Cumulative loads are necessary because the effects of previous additions persist and are additive to current applications. An important consequence of the residual effects is that if cumulative loads cause yield reductions, these yield reductions will persist even if additions of metals via sludges are stopped.

Maximum cumulative loads of metals from application of sewage sludges to agricultural land differ by an order of magnitude among groups developing the guidelines. All use the same data yet arrive at different maximum cumulative loads. In the following discussion the reasons for these differences with respect to Zinc are illustrated and several examples of alternative risk-based maximum cumulative loads are derived. These give farmers and others a perspective on how to develop a maximum cumulative load for their own situation if they are planning to landspread sludges and products containing sludges.

The most important conclusion is that there is no unqualified estimate of the best maximum cumulative load and that any estimate of maximum cumulative load is subject to much uncertainty. The EPA maximum cumulative load has a high probability of leading to some yield reduction a substantial part of the time. The NEC-28 cumulative loads are on the order of one-tenth of the EPA cumulative loads and reflect a 10% yield reduction with a probability of 10 %. Even a cumulative load of 60 kg/ha of Zn (about 2% of the EPA maximum cumulative load of 2800 kg/ha) has a 1% probability of a 30 % yield reduction for the most sensitive crops. The only way to be certain of no adverse effects is not to use sludge.

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- **TOXIC METAL ACCUMULATION FROM AGRICULTURAL USE OF SLUDGE: ARE US EPA REGULATIONS PROTECTIVE?**

M. B. McBride. 1995. Journal of Environmental Quality. 26:5-18.

**ABSTRACT**

The new USE PA regulations for the use of sewage sludges will permit concentrations of particular toxic metals to increase locally on agricultural land by a factor of a hundred or more above present soil concentrations. Short-term field experiments have shown that the adsorptive properties of sludges themselves often prevent excessive uptake of many of these

metals into crops, a protection attributable largely to the added organic matter. This protection cannot be considered to be permanent or effective for all toxic metals, as indicated by data from old sludged sites. Differences in degree of protection are evident for greenhouse and field experiments, largely attributable to different rooting patterns and degree of sludge mixing in these two situations. The USE PA reliance on field data for metal uptake by corn (Zea mays L.) has led to an underestimation of phytotoxicity thresholds applicable to a wider range of crops, in part because corn is able to root deeply and is metal-tolerant. Also, the decision to use 50% yield reduction and plant top (rather than root) concentrations of heavy metals as phytotoxicity indicators may have obscured incipient toxicity. Long-term field observations (several decades) often show that sludge-applied metals can remain sufficiently available, even in nonacid soils when total metal concentrations are below the proposed EPA limits, to harm sensitive crops and microbes. It is concluded that the ultimate impact of toxic metals from sewage sludges at levels approaching the proposed USE PA limits on various soil-crop systems is potentially harmful

- **METAL MOBILITY AT AN OLD, HEAVILY-LOADED SLUDGE APPLICATION SITE**

Brian K. Richards, Tammo S. Steenhuis, John H. Peverly, and Murray B. McBride. Preprint accepted December 1997 for publication in: Environmental Pollution. Elsevier Applied Science. Essex, England.

## ABSTRACT

This study was undertaken to determine the present distribution and mobility of sludge-applied metals at an old land application site. Trace metals concentrations were determined for soils (using 4M HNO3 extracts), soil leachates (collected with passive wick lysimeters over a 2.5 year period), and plant tissue from a field site which received a heavy loading of wastewater sludge in 1978 and an adjacent control plot. Blue dye was used to indicate preferential percolate flowpaths in the sludge plot soil for sampling and comparison with bulk soil metals concentrations.

After nearly 20 years, metals in the sludge plot leachate were found at significantly greater concentrations than in the control plot, exceeding drinking water standards for Cd, Ni, Zn, and B. Annual metals fluxes were only a fraction of the current soil metal contents, and do not account for the apparent substantial past metals losses determined in a related study. Elevated Cd, Cu and Ni levels were found in grass growing on the sludge plot.

Despite heavy loadings, fine soil texture (silty clay loam) and evidence of past and ongoing metals leaching, examination of the bulk subsoil indicated no statistically significant increases in metals concentrations (even in a calcareous subsoil horizon with elevated pH) when comparing pooled sludge plot soil profiles with controls. Sampling of dyed preferential flow paths in the sludge plot detected only slight increases in several metals.

Preferential flow and metal complexation with soluble organics apparently allow leaching without easily detectable readsorption in the subsoil. The lack of significant metal deposition in subsoil may not be reliable evidence for immobility of sludge-applied metals.

- **SOLUBLE TRACE METALS IN ALKALINE STABILIZED SLUDGE PRODUCTS**

Murray McBride. Published in the Journal of Environmental Quality 27:578-584 (1998).

**ABSTRACT**

The application of alkaline sludge products as liming agents to agricultural soils is now commonplace. Laboratory investigations of water extracts from two alkali-stabilized sludge products used in New York State reveals that 40 to 50% of the total Cu, 15 to 25% of the total Ni, and 11 to 13% of the Me dissolved out of the sludge product into water, whereas much smaller fractions of the Cd, Zn, Pb, Ag, and Hg were immediately water soluble. Speciation techniques, including differential pulse anodic stripping voltammetry (DPASV), electron spin resonance (ESR), and computer speciation calculate (MINEQL+ ), indicated that the high solubility of Cu and Ni was a result of complexation with dissolved amides or amino acids in the alkaline (pH12) water extracts. Because of the high affinity of both $Cu^{2}$+ and $Ni^{2}$+ for N-ligands in amides, these metals were mobilized much more than Pb, Zn, or Cd. The low solubilities of Ag and Hg may indicate that they were present in the sludge product as the insoluble metallic or sulfide forms. Prolonged exposure of the alkaline extracts to air caused $CO_2$ to gradually lower the solution pH to 8.1 forming a $CaCO_3$, precipitate. However, the dissolved Cu and Ni concentrations did not diminish with pH, indicating that the metal-organic complexes were sufficiently stable at pH 8.1 to inhibit metal precipitation with the $CaCO_3$. The results suggest potential for the transport of certain heavy metals from land-applied alkaline sludges into surface waters and shallow groundwater in some situations.

- **GROWING FOOD CROPS ON SLUDGE-AMENDED SOILS: PROBLEMS WITH THE U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD OF ESTIMATING TOXIC METAL TRANSFER**

Murray B. McBride.Published in Environmental Toxicology and Chemistry, Vol 17, No. 11, pp.2274-2281 (1998).

**ABSTRACT**

Abstract-The use of sewage sludges as farm fertilizers, encouraged in recent years by changes in U.S. Environmental Protection Agency (U.S. EPA) policy, has raised concerns among some scientists regarding food safety and long-term soil productivity. The U.S. EPA risk assessment for entry into the human diet of three of the most toxic metals, cadmium (Cd), mercury (Hg), and lead (Pb), utilized uptake coefficients (UCs) to calculate the amount of each metal that could enter food crops from the soil. Each UC was calculated as the increment of metal concentration in the edible part of the crop per unit increase of metal loading to the soil. However, the final UC estimates employed in the risk assessment are biased toward low values by a number of factors. These include the use of geometric means to obtain single-point averages of UCs for each crop group evaluated, rather than using arithmetic means or probabilistic methods, a systematic analytical or contamination error

apparent in the reported metal concentrations of the control crops, and the fact that most of the UC values were derived for soils with pH 6 or higher. For more than 50% of all the soil and cropping conditions represented in the risk assessment, the geometrically averaged Cd UC values used by the U.S. EPA underestimated the actual risk posed by uptake into crops. The UC values for Pb and Hg are uncertain because of analytical or contamination errors, and because of the few data available for a number of crops. These uncertainties and biases in the risk assessment would advise a more cautious approach to agricultural and home garden use of sewage sludge than is permitted by the U.S. EPA 503 rule.

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- **MASS BALANCE AND DISTRIBUTION OF SLUDGE-BORNE TRACE ELEMENTS IN A SILT LOAM SOIL FOLLOWING LONG-TERM APPLICATIONS OF SEWAGE SLUDGE**

Philippe Baveye [1,2]*, Murray B. McBride [2], David Bouldin [2], Thomas D. Hinesly [3], Mohamed S.A. Dahdoh [4], and Mamdouh F. AbJel-sabours [5]. Science of the Total Environment, In Press

[1] Department of Agricultural Engineering, Riley-Robb Hall, Cornell University, Ithaca, New York 14853; [2] Department of Soil, Crop and Atmospheric Sciences, Bradfield Hall, Cornell University, Ithaca, New York 14853; [3] Department of Natural Resources and Environmental Sciences, University of Illinois, 1102 South Goodwin Avenue, Urbana, IL 61801; [4] Desert Research Institute, Cairo, Egypt; [5] Department of Soil and Water, Atomic Energy Authority, Cairo, Egypt.
* Corresponding author.

Keywords: biosolids, heavy metals, preferential transport, percolation, environmental contamination

## ABSTRACT

Soil samples were collected at 15 cm increments to a depth of 75 cm from plots on a silt loam soil where until several years earlier and for 14 years anaerobically digested sewage sludge had been annually applied by furrow irrigation. The study protocol consisted of four replications of 6.1 by 12.2 m plots with 0 ($T_0$), 1/4-maximum ($T_1$), 1/2-maximum ($T_2$) and maximum ($T_3$) sludge application rates randomized within blocks. When sludge applications were terminated, maximum sludge-treated plots had received 765 $Mg^{-1}$ had (dry weight equivalent) of sludge solids. Total soil concentrations of Cd, Cr. Cu, Ni, Pb and Zn had been significantly enhanced by all sludge application rates to a soil depth of 30 cm. Below the 30 cm depth, total soil Cd was increased to 75 cm, total Zn to 45 cm ($T_2$ and $T_3$ only), total Cr to 60 cm ($T_2$ and $T_3$ only), but total Cu, Pb, and Ni were not increased at depth. Despite the lack of significant increases in subsoil concentrations for some metals, mass balance calculations showed a relatively high proportion of all the above sludge-borne heavy metals to be unaccounted for in the soil profile for each application rate. Mass balance calculations of losses ranged from a high of 60 percent for Ni to a low of 36 percent for Cu and Pb. Similar losses were calculated from metal concentrations measured in soil samples taken at the time the sludge was applied. In soil surface samples (0 to 15 cm) from maximum sludge-treated plots, percentages of total metal concentration extracted with 4.0 M $HNO_3$

ranged from a low of 31 for Zn to a high of 75 for Cu. Efficiency of metal extraction by $HNO_3$ was inconsistent, depending on soil horizon and sludge treatment, so that evaluation of $HNO_3$ -extractable metals is not a reliable method of estimating total metal retention in the profiles. In soil surface samples from maximum sludge-treated plots, the percentage of total metal contents extracted with DTPA ranged from a low of 0.03 for Cr to a high of 59 for Cd. The DTPA extractable levels of Cu, Ni, and Pb were higher in the subsoils of the sludge-treated soils, indicating that these metals had been redistributed from the surface layer to deeper zones in the profile of sludge-amended soil, despite the absence of elevated total concentrations of these three metals in the deeper subsoil.

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Although the preparer is required to supply the land applier with the nitrogen content of the sewage sludge, the land applier will be responsible for ensuring that the sewage sludge is applied at less than or equal to the agronomic rate for the site. Appendix E contains worksheets to help calculate the annual whole sewage sludge application rate consistent with the agronomic rate for the vegetation being grown. **These worksheets provide only one approach for calculating the agronomic rate; other approaches can be used.** Many State sludge management programs and/or local agricultural extension agents have developed their own methods for calculating the agronomic rate. Assistance in calculating the agronomic rate should be available from a knowledgeable person such as the local extension agent or soil testing department at the land grant university in each State.

In some cases, the permitting authority may specifically authorize the application of sewage sludge to a reclamation site at a rate that exceeds the agronomic rate. Such cases may include but are not limited to, reclamation sites where there is no potential for nitrate to leach down to the ground water or where the ground water is not capable of being used as a potable water supply (assuming that the State has no antidegradation policy that would apply to these waters). Typically, sewage sludge will be applied at a rate that exceeds the agronomic rate only once, to improve the physical properties of the soil and supply nitrogen and other nutrients. Once a vegetative cover has been established, future applications of sewage sludge should be limited to the agronomic rate of the vegetation grown.

## 2.6 Monitoring (40 *CFR* 503.16)

The person who prepares sewage sludge must monitor sludge quality. As mentioned in the section on general requirements, the land applier must obtain information from the preparer on the pollutant concentrations in bulk non-EQ sewage sludge. The applier of bulk sewage sludge may want to independently verify sewage sludge quality through additional testing, although **this is not required.** By independently testing the sewage sludge using EPA-approved procedures, the applier can check the reliability of the information from the preparer. Appendix C contains guidance for monitoring the quality of sewage sludge.

B-5

# The Community School

Perkins Farm
1164 Bunker Hill Road
South Tamworth, NH 03883-4170

Testimony before the NH House
Resources, Recreation and Development Committee
For amendment of HB 546-FN-A
March 2, 1999

My name is Martha Carlson, I am director of The Community School in Tamworth. We own a 300 acre farm abutting one of the Ambrose Brothers gravel pits. I am a certified well operator under the NH DES and test our school well for 65 different elements and compounds on a regular basis. I am concerned that the spreading of any municipal sludge or paper co. waste materials on the Ambrose pits will travel through the aquifer and come up in my well.

I would like to recommend that you amend this bill to allow for other types of research on reclamation of sand pits. I am particularly interested in reclamation using organic plants.

It seems pretty obvious to me that nitrates can and will travel through ground water. Any high school chemistry student knows that salts dissolve in water. And salts increase the effectiveness of a liquid electrolyte. Nitrates from sludge will dissolve in ground water easily. And they'll make it easier for water to transport heavy metal ions.

I object strenuously to the use of sludge on the sand pits. The pits near my school are dug down to or into the ground water. That is why the pit operator stops digging: water floods his operation. At the Ambrose pits, I can stick my finger into the sand and find a seepage of water. Pools dot the surface of the pit floor, open windows to the ground water below. The sand is a gigantic sponge, saturated with water most of the year. Anything we put on that sand will dissolve with rainwater and snow and travel into that ground water, which my students and my neighbors and I drink.

So I've been interested in alternatives. Mr. Robert Ambrose has agreed to work with my school to explore alternatives. We could use research support. We know that pines and other conifers can thrive on this land. Mr. Ambrose and others have reclaimed pits with trees for years, with success. My students and I helped reclaim the Sandwich Town dump with pines years ago and those trees now are a thick forest on pure sand and gravel.

We are hoping to explore other income-producing options. Wild cranberries grow on

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one of the Ambrose pits. Cranberries are a potential agricultural product for this pit and many others in NH. The Cape Cod cranberry barrens are in danger today because of ground water pollution. The wild species in NH may be resistant to some cranberry blights. We'd like to learn whether it would be feasible to grow these plants commercially. We'd like to explore also high bush blueberries which, as every NH canoeist knows, love having wet feet.

A small grant such as your research funds would allow us to conduct the preliminary fact finding we need just to apply for larger federal grants. The U.S. Dept. of Agriculture might be interested in a research grant under their Sustainable Agriculture Research and Education program. At this point, I hope to hire a summer horticulture major from UNH to build that grant application. We need to know how many acres of cranberries are already there, what species are they, what brush removal will be required, how much earth moving might be needed. We need to interview Commissioner of Agriculture Steve Taylor to find out whether there are farmers in this area who might be interested in a new crop, whether farmers such as the Gilmanton Iron Works blueberry farmers would have equipment available in the fall for cleaning and packaging a new berry crop. These are simple questions but ones which are essential to answer before we engage in a trial growing project. Your small grant would be ideal for such exploration.

The sand pits in my area, Tamworth, Ossipee and Madison lie atop the Ossipee aquifer, an underground reserve of water supposedly large enough to serve all of metropolitan Boston. It is imperative that we guard this resource carefully. Nitrates, nitrites, heavy metals and petroleum compounds, all found in sludge, could cause permanent damage to this treasure. Any pit operator would be delighted to choose an alternative reclamation action which would bring him the community's support and applause rather than suspicion and fear. Your grant might open the way to proving that planting trees or growing cranberries are viable options to sand pit reclamation.

Thank you.

B-6

**Subject: HB 335 SB 218 Response to Industry Testimony**
**Date:** Sun, 04 Apr 1999 11:55:34 -0400
**From:** "Caroline G. Snyder" <cgsnyder@post.harvard.edu>
**To:** Betty Hall <hallmfg@jlc.net>

HB 335

April 5, 1999

To: NH House Environment and Agriculture Committee
From: Citizens for a Future New Hampshire
Re: Using sludges to reclaim NH gravel pits

In their written March 17 testimony opposing HB 335, the Business and Industry Association of N.H., Wheelabrator Bio Gro, BFI, and the American Forest and Paper Association misused scientific data to support their statement that sludging N.H. gravel pits "has long been recognized as . . . safe and environmentally sound."

In their testimony, these industries compare the successful reclamation of highly polluted strip mine spoil areas to the reclamation of N.H. gravel pits. But William Sopper's research on strip mines is not at all applicable to N.H. gravel pits. As UNH soil scientist Robert Harter points out: " The two situations ( N.H. gravel pits and Appalachian strip mines) are significantly different. The strip mine spoil surface is well away from the subsurface water table ( 27' to 75') and the spoil contains material that can be toxic to plants and groundwater. Establishing a vegetative cover decreases dissolution of these spoil contaminants by both overland flow and flow of water through soil.

On the other hand, gravel pits are.. . mined within inches of the seasonable high water table ... and the gravel is relatively free from dissolvable contaminants. In addition, gravel pits are usually located on important aquifers. Thus, whereas addition of biosolids to strip mine spoil can protect water supplies, addition (of sludge) to a gravel pit potentially adds a source of contamination in a location maximizing contact potential. Even so-called clean biosolids will probably yield nitrates to the ground water. . ." ( March 20, 1998 Position Paper).

We deplore that Wheelabrator, BFI, and the American Forest and Paper Industry, eager to find places to put their waste products, will misuse William Sopper's research in an attempt to mislead legislators into the false belief that sludging N.H. gravel pits is safe.

Caroline Snyder, President
Citizens for a Future New Hampshire
--
Caroline G. Snyder cgsnyder@post.harvard.edu

B-7

**Subject: Arsenic in Sludge**
**Date:** Mon, 05 Apr 1999 18:26:47 -0400
**From:** "Caroline G. Snyder" <cgsnyder@post.harvard.edu>
**To:** Murray McBride <mbm7@cornell.edu>

Murray:

A Dartmouth study on arsenic in private NH wells to be published May 1 in Env. Science and Technology, shows arsenic levels in some cases 3 times higher than what is currently deemed safe by federal law ( i.e. 3 x 50 ppb.) At the same time a National Academy of Science study is prompting EPA to finally tighten its arsenic standard for drinking water.

~~Lowel~~ Sludge which is land applied in NH and put on gravel pits located on aquifers at 100 tons per acre (mixed with 400 tons of paper mill sludge) contains fairly high levels of arsenic - up to 26 ppm.

Does arsenic in sludge mobilize? Is it soluable? How does pH or the solvents in paper mill sludge effect the mobility of arsenic into ground water?

Thank you for all your help in the past, esp. the material on molybdenum and your recent articles on metal mobility. NH is about to allow lime stabilized sludges containing 27 ppt of dioxin TEQ and 35 ppm of molybdenum to be top dressed on dairy pastures with only a 45 day waiting period. Needless to say, we are objecting strenuously.

We would be grateful for any information on arsenic.

Caroline (President of Citizens for a Future NH)
--
Caroline G. Snyder cgsnyder@post.harvard.edu

**Subject: arsenic mobility**
**Date:** Tue, 6 Apr 1999 09:02:25 -0400 (EDT)
**From:** Murray McBride <mbm7@cornell.edu>
**To:** cgsnyder@post.harvard.edu

Dear Caroline,

I will be very interested in seeing the study of New Hampshire wells when it comes out. There is little information on arsenic behavior in sludge, but the EPA 503 risk assessment on groundwater contamination by sludge used arsenic as the "worst case", that is, the most likely of the regulated metals to leach.They avoided a "problem" with arsenic in groundwater by assuming a very large dilution of the metals before they got to the wellhead.

More recent information is available from a study by Dr. B. Sawhney and others at the Connecticut Agricultural Station, New Haven (I don't recall the actual journal , but I can find it for you, if you're interested). They showed high mobility of arsenic leaching from sludge composts. Organic matter does not retain arsenic very effectively, although certain soil minerals can adsorb arsenate if the pH is low. Of course, in sandy or gravelly soils, there is little to hold the arsenic against leaching.

Murray

GES

C-1

Specializing in Wetlands and Soils

May 10, 1996

Selina J. Makofsky
Sludge and Septage Program Manager
Dept. of Environmental Services
6 Hazen Drive
Concord, NH 03302

Dear Ms. Makofsky,

I am enclosing a set of soil criteria which should be considered as a minimum standard for land application of septage and sludge. The criteria presented here are based on the following current standards designed to protect public health and safety by maintaining both surface and groundwater integrity:

- The US Army Corps of Engineers Wetlands Delineation Manual, 1987
- Field Indicators For Identifying Hydric Soils In New England , Version 1, 1995
- NH DES Subdivision And Individual Sewage Disposal System Design Rules, Env-Ws 1000, 1995
- Buffers for Wetlands and Surface Waters: A Guidebook for New Hampshire Municipalities, 1995
- NHDES Stormwater Management and Sediment Control Handbook, 1992
- UNH Cooperative Extension Best Management Practices: Biosolids, 1995
- USDA Forest Service, Forested Wetlands: Functions, Benefits and the Use of Best Management Practices, NA-PR-01-95

Based on the above standards we make the following recommendations regarding sludge and septage landspreading.

Sludge and Septage should <u>not</u> be spread or stockpiled (if applicable) on :

- hydric soils as stated in Env-Ws 800 NH Septage And Sludge Management Rules, March 1996.

- soils where depth to bedrock is less than or equal to 18 inches.

- soils whose permeability rate is greater than 6 inches per hour.
- annual floodplains.
- slopes as addressed in Env-Ws 800 NH Septage And Sludge Management Rules, March 1996.
- as addressed in Env-Ws 800 NH Septage And Sludge Management Rules, no stockpiling shall be permitted in the 100 year floodplain , however, spreading should be limited to the time when flood hazard is at a minimum.

In addition, it is strongly recommended that erosion control methods be utilized during reclamation landspreading in sensitive aquifer recharge areas and in watershed areas.

The fastest and most cost efficient way of identifying these sensitive areas is to utilize a site specific soils map, done at a scale not to exceed 1"=300' and accompanied with a descriptive soil narrative. This work should be done by someone who is both knowledgeable and qualified to perform this work.

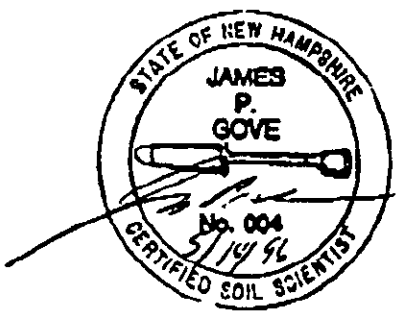
These criteria are strongly suggested as a minimum standard and are put fourth for further discussion and peer review. If you have any questions, please do not hesitate to call.

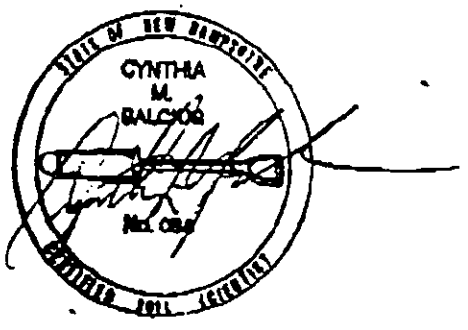
Sincerely,

GOVE ENVIRONMENTAL SERVICES, Inc.

James P. Gove, CPSC, CSS
President

Cynthia M. Balcius, CSS
Soil Scientist




GES

C-2

**ALICE MINTER TRUST**
PO BOX 34475
N. KANSAS CITY, MO. 64116
Fax 816-505-3535
Phone 816-748-0112

August 28, 1998

RE: BACTERIAL FOOD POISONING

ON AUGUST 16, 1998 THE ALICE MINTER TRUST COLLECTED SOIL SAMPLES FROM ITS FARM WHERE TOXIC CONTAMINATION WAS SUSPECTED. NO SLUDGE HAD EVER BEEN APPLIED ON THE FARM WHICH WAS ADJACENT TO KANSAS CITY, MISSOURI'S 1200 ACRE BIRMINGHAM TREATMENT PLANT SITE. NO SLUDGE HAD BEEN APPLIED TO THE CITY OF KANSAS CITY'S SLUDGE DRAINAGE AREA FOR ALMOST A YEAR SO WE WERE SHOCKED BY THE TEST REPORTS THAT REVEALED BOTH SALMONELLA AND E. COLI AT A LITTLE LESS THAN 800,000 COL/100 ML. THAT IS 800,000 BACTERIA PER 100 GRAMS. EPA CLAIMS IT WILL ALLOW NO MORE THAN 33 SALMONELLA BACTERIA PER 100 GRAMS IN SLUDGE FERTILIZER. WHAT WAS MORE AMAZING WAS THAT THE TESTS REVEALED FECAL COLIFORM BACTERIA AT A LEVEL OF 650,000 ON A FARM ROADWAY WHERE NO SLUDGE HAS BEEN APPLIED SINCE 1991. A FOURTH TEST COMPARING FECAL COLIFORM TO FECAL STREP REVEALED THAT THE TOXIC CONTAMINATION WAS FROM HUMAN WASTE.

FOR THE PAST 10 YEARS EPA AND USDA HAVE CLAIMED INFECTIOUS PATHOGENIC DISEASE ORGANISMS WERE DESTROYED IN THE SEWAGE SLUDGE WHICH THEY ACTIVELY PROMOTE FOR USE AS A SAFE FERTILIZER FOR FOOD CROP PRODUCTION AS WELL AS FOR HOME LAWNS AND GARDENS. AFTER EPA RELEASED ITS PART 503 SLUDGE USE GUIDE IN 1993, BACTERIAL FOOD POSIONING INCREASED DRAMATICALLY. BETWEEN 1994 AND 1996 BACTERIAL FOOD POSIONING INCREASED FROM 6.5 MILLION INCIDENTS TO 80 MILLION INCIDENTS.

IN MAY 1996, RALPH J. TOUCH, CHIEF SANITARIAN FOR THE U.S PUBLIC HEALTH SERVICE REPORTED IN HIS "EMERGING INFECTIOUS DISEASES" PAPER THAT THE CENTERS FOR DISEASE CONTROL ACKNOWLEDGED THAT BACTERIAL FOOD POSIONING AFFECTS AS MANY AS 80 MILLION PEOPLE ANNUALLY.

IN MAY 1997, THE SIX FEDERAL AGENCIES RESPONSIBILE FOR FOOD SAFETY WHICH INCLUDES THE FDA, CDC, USDA AND EPA REPORTED TO THE PRESIDENT IN "FOOD SAFETY FROM FARM TO TABLE, A NATIONAL FOOD-SAFETY INITIATIVE" THAT THERE WERE ONLY BETWEEN 6.5 AND 33 MILLION FOOD RELATED ILLNESSES IN THE UNITED STATES EACH YEAR. IT WOULD APPEAR THAT THE CDC FORGOT TO USE ITS CURRENT DATA, SINCE THE NUMBERS QUOTED WERE FROM 1994.

THE 1998 CERTIFIED LABORATORY'S TEST REPORTS SHOW THAT NOT ONLY WILL BACTERIA SURVIVE THE TREATMENT PROCESS, BUT IT WILL SURVIVE FOR LONG PERIODS OF TIME. IT WILL ALSO LEAVE THE SLUDGE SITE AND WILL REGROW IN THE SOIL. RESEARCH ALSO SHOWS THAT PATHOGENS WILL BE TAKEN UP INSIDE THE FOOD CROP.

THE TESTS REVEALED THAT EPA AND USDA LIED TO US. WHEN THEY CLAIMED ALL THE PATHOGENS WOULD BE DESTROYED WITHIN 30 DAYS. NOT ONLY IS IT NOT SAFE TO GROW FOOD CROPS AFTER 30 DAYS, ITS NOT SAFE TO GROW CROPS ON CONTAMINATED SOIL A YEAR AFTER SLUDGE HAS BEEN APPLIED AND IT MAY NEVER BE SAFE.

IS THE EPA WILLINGLY DESTROYING OUR FOOD CROP PRODUCTION LAND AND IT'S FARMERS TO PROVIDE A CHEAP MEANS OF DISPOSAL FOR SEWAGE TREATMENT PLANTS?

# Q W A L  L A B O R A T O R I E S,  I N C.

2911 ROTARY TERRACE, P.O. BOX 562/PITTSBURG, KS 66762/(316)232-1970

**LABORATORY REPORT:** **REFERENCE #:** 9808488

SENT TO: *ALICE MINTER TRUST*
*P.O. BOX 34475*
*N. KANSAS CITY, MO 65116*
**JAMES BYNUM, TRUSTEE**

DATE REPORTED: 08/19/98
DATE COLLECTED: 08/16/98
DATE RECEIVED: 08/17/98
P.O. #:

PROJECT: PATHOGEN TESTING

**Sample ID: SOIL 1** Sample Matrix: SOIL
Sample Date Collected: 08/16/98

| TEST | METHOD | RESULT | UNITS | DL | ANALYZED | BY |
|---|---|---|---|---|---|---|
| FECAL COLIFORM | SM9222 D | 9000 | COL/100 ML | 1 | 08/17/98 | KPP |
| SALMONELLA (MPN) | | >800000 | COL/100 ML | 1 | 08/17/98 | KPP |

**Sample ID: SOIL 2** Sample Matrix: SOIL
Sample Date Collected: 08/16/98

| TEST | METHOD | RESULT | UNITS | DL | ANALYZED | BY |
|---|---|---|---|---|---|---|
| E. COLI | SM 9222G | >800000 | COL/100 ML | 1 | 08/17/98 | KPP |
| FECAL COLIFORM | SM9222 D | 3000 | COL/100 ML | 1 | 08/17/98 | KPP |

**Sample ID: SOIL 3** Sample Matrix: SOIL
Sample Date Collected: 08/16/98

| TEST | METHOD | RESULT | UNITS | DL | ANALYZED | BY |
|---|---|---|---|---|---|---|
| FECAL COLIFORM | SM9222 D | 650000 | COL/100 ML | 1 | 08/17/98 | KPP |

**Sample ID: SOIL 4** Sample Matrix: SOIL
Sample Date Collected: 08/16/98

| TEST | METHOD | RESULT | UNITS | DL | ANALYZED | BY |
|---|---|---|---|---|---|---|
| FECAL COLIFORM | SM9222 D | 50000 | COL/100 ML | 1 | 08/17/98 | KPP |
| FECAL STREP | SM 9230 C | 10000 | COL/100 ML | 1 | 08/17/98 | KPP |

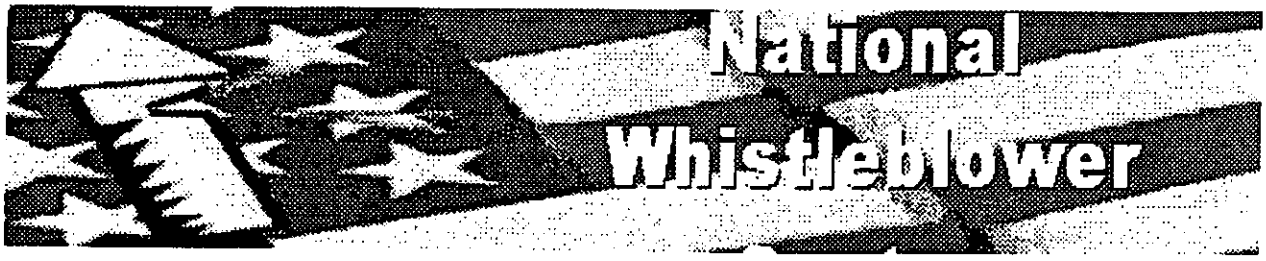
TERRY A. KOESTER
President
Phone (316) 232-1970
FAX# (316) 232-7730
2911 Rotary Terrace
P.O. Box 562
Pittsburg, Kansas 66762

Domestic - Industrial - Municipal
*Certified Laboratory



Q.W.A.L. LABORATORIES, INC.

C-3




# PRESS RELEASES

Initial Release

Second Release

**National Whistleblower Center**
**Contact:**
**Stephen M. Kohn, David Lewis**

**FOR RELEASE MARCH 23, 1999**

## EPA WHISTLEBLOWERS ISSUE WARNING THAT "BAD SCIENCE" AT EPA LINKED TO THE DEATH OF A NEW HAMPSHIRE MAN

## The Science of EPA's "Sludge Rule" - which Governs the Disposal of All Municipal Waste -Is Challenged By Leading EPA Whistleblowers

## EPA Whistleblower Retaliation Documented as National Problem

**Washington, D.C.** On March 23, 1999 four EPA employee-whistleblowers, the mother of Shayne Conner (a young man who died after exposure to EPA-approved "sludge") and representatives from three public interest groups are holding a press conference at 9:30AM in the Zenger Room, National Press Club, 14th and F Streets N.W.

The EPA employees shall issue a national warning that EPA officials regularly ignore and retaliate against the recommendations of their own scientists on a variety of issues central to public health. The mother of a New Hampshire man, who died after exposure to EPA-approved "sludge," shall join with the scientists in stressing the importance of sound science in environmental regulations. The "sludge rule" at issue in the New Hampshire case, governs the disposal of all municipal waste in the United States.

-END-

# Statement of David L. Lewis, Ph.D.

***The death of Shayne Conner***

Recently, a New Hampshire woman by the name of Joanne Marshall filed suit against a waste management company after her son, Shayne Conner, died. Although the autopsy was inconclusive, a number of people in their neighborhood became ill after strong winds blew in their direction across piles of sludge left standing on an adjacent farm. From kitchen tables to bed spreads, every surface became covered with layers of the dust.

No one knows why Shayne died. What surprised and frustrated his mother, however, is that no one really wanted to know. Her efforts to have EPA and state officials investigate whether her son's death was related to his exposure to sludge met with resistance and resentment.

As important as it is to know why Shayne died, it's even more important to understand why government officials didn't want to find out. "There are no documented cases of anyone ever being harmed by sludge." That's EPA's mantra. It's what agency officials feel is their strongest argument supporting the safety of the 503 sludge rule. The first person whose death gets linked to exposure to sludge is likely to open the door to a lot of questions EPA doesn't want asked.

Having promulgated the sludge rule, EPA can't take the position that industrial wastes and pathogens in sludge put the public at risk. On the other hand, whenever EPA is forced to defend this position it undermines their ability to justify an aggressive regulatory agenda to eliminate all traces of these contaminants everywhere else in the environment.

Last November, the author of EPA's sludge rule testified to the New Hampshire state legislature. When asked why EPA considered sludge too toxic for dumping in oceans but safe for spreading on farmland, he replied that it *isn't* too toxic for the ocean. It was just that the public was upset after seeing municipal wastes washing up on beaches. "The reason why we got it out of the ocean," he said, "was basically a image-political type deal."

Unfortunately, the sludge rule is no exception. EPA and its supporters in Congress have come to base all of their actions on image and politics rather than sound science. What is allowed in the food we eat, the water we drink, and the air we breathe no longer has anything to do with protecting public health and the environment and everything to do with winning elections.

The last thing EPA wants is for any event, such as Shayne's death, to focus public attention on the 503 sludge rule. Nevertheless, people need to understand that environmental regulations must be guided by sound science instead of partisan politics. Otherwise, the EPA will end up creating far bigger problems than it ever solved. The sludge rule clearly shows that EPA is well on its way to doing just that.

[Disclaimer: These remarks do not represent official policies of the US EPA.]

# Statement of Joanne Marshall

My name is Joanne Marshall and I come from a small town, Greenland, New Hampshire. Greenland is a suburb of Portsmouth, New Hampshire where the Portsmouth Naval Shipyard and the former Pease Air Force Base reside. It was once a rural community, and has a few remaining hay farms left and one dairy. The neighborhood where we live, is a quiet neighborhood, where folks gather while shoveling snow, planting their gardens or walking their dogs. I used to call it "God's little acre." A great place to raise families until it was disturbed in October of 1995, when large tractor-trailer trucks began rolling down our street, in the early morning hours before most people were stirring. These trucks were depositing truckload after truckload of some smelly, murky stuff and piling it on a field next door.

At first there was a faint smell of something in the air. Being down wind from the field, I smelt it most. In all my thirty or so years of living on this street, I never smelt anything like that. I was told the truckers were dumping, in short, a four-letter word beginning with s and ending with t. -- Sewerage, human waste. I remember thinking how inconceivable this was. On October 31st, a week later, I arrived home from work in a hurry. It was Halloween and my little girl was late trick or treating. Grabbing my bags I bolted out of the car only to be greeted by such as stench, it took my breath away. Nausea hit me like a ton of bricks and as soon as I was inside I ran for the bathroom. That frightful night became the turning point or our serene neighborhood and the beginning of nightmarish weeks and months to come.

We called the police department, who knew nothing of the dumping and then the chairman of our Selectmen, who said he also knew nothing. We then called the owner of the field, an elderly widow, who told us that her hayer persuaded her to use this stuff on her field. She said she was told that this stuff would be beneficial to the environment. She was very sorry for the smell, but assured us, as she was assured, that it was healthy and okay.

As days and weeks went by we became sicker and sicker. Not just my family, but our whole immediate neighborhood. We all shared the same symptoms; first nausea and vomiting followed by severe stomach cramps and migraine headaches. Then fever and flu like symptoms, more respiratory. There was a continual battle of thick mucous, one that made it hard to swallow and discharge. At times it appeared as if our reflex system had slowed because you would gag on the mucous and sometimes choke to dispel it. Often it would wake you because your breathing passages were blocked by it.

Upon discovering that my neighbors were experiencing the same problems, I contacted the Governor's office, which directed me to Health and Human services, Risk Assessment. The gentleman I spoke with said that our symptoms were symptoms of sludge exposure. I asked if we could have someone come out and test this stuff, but he said he was not the one to do it. He gave us several names stemming from people of DES to the Regional EPA office in Boston. Our efforts to contact these people were fruitless. Our phone calls were not returned and if they were, we were treated rudely or given another name to contact. Between my neighbors and myself, we went full spectrum in the contacts we were given, which resulted in nothing.

Approximately three days later, the evening of Thanksgiving, I kissed my son, Shayne of 26 years, goodnight, for the last time. Around four am that morning, I was awakened to a frightful scream from my other son, who was home from college during the holiday. When I ran to the room, Shayne appeared unconscious, yet he seemed like he was gasping. 911 was called and all I could do was hug him and wait for the paramedics. We spent what seemed like an eternity in the hospital waiting room, only to be told my son was dead.

The weeks that followed were even more brutal if that were possible. We couldn't grieve for our son, because we were too busy fighting illnesses and spending sleepless nights, watching over my little girl sleeping, trying to pass the mucous in her throat and fighting viruses. Trips to the doctors and hospital emergency rooms became a frequent thing for my neighbors and us. As one who seldom ever was administered an anti-biotic in her lifetime, I went through approximately seven prescriptions of antibiotics within a year. Two of us were diagnosed with Pleurisy. Three to four or us developed abscesses and cysts that needed to be lanced. There were recurring allergenic illnesses in the young babies of the neighbors that the doctors could not pinpoint the cause. The men suffered severe nosebleeds that were unstoppable. Some of the children suffered unbearable migraine headaches. Both my neighbor and I had tumor masses surgically removed from our breasts. One neighbor suffered heart failure and one was bedridden for weeks. The list goes on and on. By the end of two years, five cats (all mousers) (two mine and three my neighbors as well as my other neighbors older dog died, all from tumors.

Again to get someone to help us proved futile. Even when noted violations to the 503's were cited, those, whose salaries are paid by us, seemed unconcerned and closed a deaf ear. Even the death of my son, was not enough to rouse them and investigate the possibility and/or eliminate the connection. Instead they fumbled at trying to find other causes to prove it wasn't the sludge. Even when the autopsy report stated the immediate cause as respiratory and the underlying cause as inconclusive; none of our officials sprang to action. All our phone calls, eventually, went unanswered and we were left to deal with the unknown ourselves. Doctor's wouldn't or couldn't help. Their reply was that they didn't know what they were dealing with. Yet they were sure to load us up with plenty of antibiotics. It didn't seem to matter that one life was lost and no one knew why. It didn't seem to matter that proven records of healthy citizens prior to the sludge dumping, were all experiencing illnesses of various kinds and medical problems. This was not a concern. Our officials and the people responsible appeared indifferent and uncaring; after all, it was only one life.

I'd like to take a few minutes to tell you about that one life lost. At a very young age Shayne learned that he could do anything he set his mind to doing with faith and God and determination. In kindergarten we learned that Shayne had a learning disability and when educators said that Shayne would never be able to read, Shayne learned to read fluently within a few month of first grade, with the help of a devoted Special Ed teacher. When they said he would never be able to function in a main stream school environment.

Shayne's determination merited him all mainstream classes by his senior year in high school, with the help of another devoted teacher. Shayne was noted for giving 110% in every thing he did. When they told him that could never go to college, Shayne applied to a vocational college and was accepted and attended. Shayne loved sports and where most would have been rejected to play on school teams, Shayne won the admiration of his coaches and peers through his determination and was often awarded the most improved member of the team. In college he was given the Coaches Award for his merit, example and dedication to the team. Through his achievements, Shayne became an example and inspiration to all, particularly those like him.

However, what Shayne was particularly noted for was his love and sensitivity with people. He could pick a troubled person out in a crowd go to them, befriend them and put a smile on their face. If you needed him, no matter who you were, stranger, family or friend, he would drop everything and be there for you. Mourners came from miles around at Shayne's wake. He had touched the lives of so many people; it was hard to conceive. Even after extending visiting hours, the funeral home had to close the doors on people who were still lined up to pay their last respects. Today, people still come up to me and tell me how much they miss my son.

So, you see ladies and gentleman, one life does make a difference and one life is very important even though he may not be some famous person or celebrity. And I'm afraid we take these lives for granted, with an attitude that all life is a risk or one of indifference.

Today we spend millions of dollars, investigating crimes, tracking down criminals who perpetrate the rights of other individuals. We spend more monies providing them a fair trial and then when convicted more monies in providing them food and shelter and rehabilitation in our prisons. I am not against this. Yet, when one good citizen dies of unknown causes after a new and potentially unexplored substance had been deposited on a field next door, a preliminary autopsy is held with minimal funds, and then no more is done. There's something to be said of this. At the same time, when it comes to insure the health and safety of our citizens, money seems to take the forefront at the risk of lives. I want to quote what one representative, of the company that dumped the sludge, said when I expressed concern of the risks involved and whether there was a more ecological way of disposing this stuff. He said, "all life is a risk, lady!" And there are more ecological ways, "but they're too expensive." Yet they have given this substance to unsuspecting farmers for free. What does that say? At the expense of saving a dollar, we take the risk of expending good lives, lives of good citizens. Citizens that make this country what it is and what it will be tomorrow. In my experience, the indifference in regard to these matters is profound.

My question is one. Are we band-aiding our problems by coming up with more medicines and methods to cure our ills? Or, are we spending the time and effort to get to the root of these problems and eliminate the source. Scientists such as those who have spoken here today, are finding that sludge dumping can affect the health of people and

pollute land and water. Are we listening or ignoring the warnings of these scientists?

In closing, I will leave you with this one thought. Shayne faced many disappointments and obstacles in his lifetime, but he always found a way around them, over them or through them. Our First Lady wrote a book called "It Takes A Village" to raise a child, however, it took a huge conglomerate, greed and indifference to destroy him!

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Attachment 2

Leslie E. Roberts
87 Hackett Road
Belmont, NH 03220
(603) 267-8135

To: Senator Carl R. Johnson
Senator Edward M. Gordon
From: Leslie E. and Suzanne S. Roberts SSR
Date: March 23, 1999
Re: SB 218

We write in opposition to SB 218.

We are preserving prime farmland at our farm in Belmont, keeping the land open and productive while using applied biosolids in the process.

We consider the recycling of nutrients by land application to be beneficial
to our land,
to the farmer now using it,
to the crop it nourishes,
to the public which is served by the Winnipesaukee River Basin sewer system,
and to all who enjoy using the resulting improved ground and surface waters and aquatic environment enabled by the system.

We are retired farmers, privileged to be stewards of land which has been in cultivation of one kind or another since the late 1700's. We consider this to be a treasured resource to be preserved. We would not do anything to harm the land, our drinking water, or our neighbors.

People forget -

that benefits should be balanced off against risks. Under present State standards the benefits far outweigh any risks. Changes should be based on real, factual science and field studies, not on emotional or deliberately developed misunderstandings

that when the Winnipesaukee Basin water clean-up project was being developed in the 1970's, it was recognized that what was taken out in the purification of wastewater would have to be recycled or disposed of. It benefits everyone to recycle the product on land that benefits from its monitored use

that the replacement of naturally occurring trace elements in soils which have been depleted is also part of the equation.

In general we feel that SB 218 is unnecessary over-regulation.

NH
WATER POLLUTION CONTROL ASSOCIATION

April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, NH 03301

**RE: SB 218 - Inexpedient to legislate**

Dear Chairman Russman:

The New Hampshire Water Pollution Control Association (NHWPCA) is strongly opposed to SB 218 regulating the land application of sewage sludge. As written, this bill will in effect be a ban on the beneficial use programs that have been underway for the past twenty-five years in New Hampshire. ***We urge the committee to vote inexpedient to legislate on this bill.***

There are several reasons SB 218 should be dismissed as inexpedient to legislate.

1) The bill attempts to address issues such as notification, metal limits, site suitability, and management practices that are already addressed through the NH Department of Environmental Services (NH-DES) Env-Ws 800 Sludge Management Rules. These issues belong in regulation, not statute.

2) The language in the bill is ambiguous and provides no discernable scientific basis for added restrictions that the NH-DES already regulates in the existing technical sludge management program.

3) Requiring landowners to record the use of "non-low metals sludge" in the registry of deeds is unreasonable and serves no purpose, especially when other materials such as commercial fertilizers, manures, herbicides and pesticides are not also required to be registered. Furthermore, the "high metals sludge" in New Hampshire are already "low-metals sludge" when compared to the federal and other state metals standards.

4) Highly technical and complex issues such as dioxin levels and use restrictions is a regulatory issue and should be handled by the NH-DES staff who have the expertise and resources to properly regulate. Debate and promulgation of standards by a legislative body with no scientific basis is not a sound approach to this issue.

5) Wastewater treatment facilities in New Hampshire enjoy a high rate of recycling and beneficial use of the biosolids generated annually throughout the State. However, requiring these facilities to accept septage from other towns that may have a ban on recycling biosolids is a policy inconsistent with existing statute (RSA 486:13 Disposal of Septage) requiring all towns to provide an outlet for their own septage. In addition, the cost for recycling biosolids increases due to local bans. It would be

P.O. Box 95
Concord, NH
03301

inconsistent for a host WWTF to accept septage from a ban-town thereby increasing its own costs for handling and recycling of the final biosolids produced.

6) If SB 218 is enacted to law, the subsequent increased costs will be in violation of the NH Constitution Part 1, Article 28-a that protects municipalities from unfunded state mandates.

There are several other specific details of SB 218 that are of concern to the NHWPCA. However, rather than analyze each component of the bill, ***the NHWPCA respectfully requests that the committee vote "inexpedient to legislate" and let the newly revised Env-Ws 800 Sludge Management Rules, the existing random testing program, and the competent technical staff of the NH-DES regulate the beneficial use of biosolids.***

Respectfully submitted,

Douglas W. Steele, II
President
New Hampshire Water Pollution Control Association

cc: Harry Stewart, P.E., NH-DES
Chairman Musler, Environment & Agriculture Committee
Judy Silva, Esq. - NH Municipal Association
Susan Arnold, Governor's Office

ROCKY - HILL FARM
Dale & Jacqueline Lewis
Box 159, R. F. D.
Haverhill, New Hampshire 03765

4-01-99

To Senate Sub Committee HB 218

We have made an effort to be here to make you aware we have used sludge on our dairy farm for the last 2 years. We have used it in accordance with the best management practices. When we began using sludge our soils were tested and our soils are retested yearly and we have seen no increase in heavy metals. The crops have yielded exceedingly well and we have not experienced any odor problems nore problems from area neighbors.

As credible science indicated when we first investigated the use of sludge we have encountered no problems. Therefore based on our experience we feel sludge for our ag purpose as an extremely valuable resource. It also replaced commercial fertilizer and helps control the waste stream. It has made our dairy operation more viable by cutting input cost while maintaining crop yields.

We feel this would be a catastrophic blow to loose this resource simply because some people refuse to recognize credible science. A small nucleus

of people have misrepresented and distorted the facts and created a false alarm in our town of Haverhill as well as other towns all over the state. Bills such as this only add fuel to the fire.

We feel this committee should avail itself of the true facts of the matter and so doing we trust you will make the right decision.

Sincerely

Dale & Jackie Lewis

P.O. Box 651
Center Harbor, NH 03226

April 5, 1999

The Honorable Carl Johnson
The Senate of New Hampshire
State House
Concord, New Hampshire 03301

Dear Carl:

Following is my statement regarding Senate Bill 218 since I was unable to conclude my testimony at the Senate hearing on Thursday, April 1st.

My family has farmed in New Hampshire since before 1700 to the present day. My own interruption was to go to flying school in 1942. Although my career was flying military aircraft, I observed agriculture the world over, first in China-Burma-India in World War II and later as a pilot in Special Missions for 17 years in Washington, D.C. I had the opportunity to observe sludge/biosolids being recycled for the purpose of building soil and the production of food in almost every country of the world as the geographic lines existed through those years.

After retiring in September of 1969 I again got back into farming to find the grand fields of my youth mostly grown up in forest land, and what was still open, completely run down as far as soils were concerned.

We presently farm over 100 acres in fields located in two towns. We started using sludge/biosolids in 1990 with great success. Prior to use we investigated all of the concerns being brought up presently with studies from farm publications, university studies, and any other source we could find. We determined that under the Federal and State Regulations in place, and the prior testing of the material, that it was a safe and efficient way to build up soil.

Our Class B material was checked for metals and met pathogen reduction standards. In addition our soil was and is tested.

Under proper management the recycling of sludge/biosolids for land upgrading is a definite plus for the environment for the long term.

The number of House bills for this year is too many fires in one forest. I support HB 504 and HB 222. I oppose HB 335-334-472-370.

I believe that most of the anti-sludge people feel that they are saving us from ourselves, but I think that an objective and beneficial solution can be determined by DES and Health and Human Services much better than laymen activists who utilize the media with emotional half-truths and hearsay.

I am in my 30th year as a Selectman of Center Harbor, and I have had occasion to work extensively with all the departments that are now under one DES. I represented our town along with Meredith in solving our joint solid waste problem. (We have a good system.) I discovered during this time that we are lucky to have the dedicated and proficient people that represent our State Government.

I proudly fly the State flag under the American flag 365 days a year as my feeling for our State Government.

I hope that you do not pass SB 218.

Sincerely,

LEWIS C. HANSON
Colonel, USAF (Ret.)

cc: Robert Varney, DES
Susan Arnold, Governor's Office
Councilor Ray Burton
NH Municipal Association
Steve Taylor, Dept. of Agriculture
NH Farm Bureau

Attachment [redacted] AA

# Testimony before the New Hampshire Senate Environment Committee in Support of SB 218 as Amended

**Sierra Club of New Hampshire**

May 6, 1999



**RCR Consulting**
R. Christopher Rueggeberg
310 Baptist Road
Canterbury, New Hampshire
603-783-9372
603-224-8222

Chairman Russman and members of this committee, thank you for the opportunity to speak before you today in support of Senate Bill 218 as amended. The New Hampshire Sierra Club supports the passage of SB 218 as a response to the new and inadequate sludge rules adopted by the Department of Environmental Services ( DES ).

One purpose of SB 218 is to legislatively provide regulations for the land application of Class B sludge that will protect the water quality of New Hampshire's surface waters. SB 218 requires a minimum buffer distance of 250 feet between land applied Class B sewage sludge and surface waters in the state. This language is consistent with the provisions of the New Hampshire Rivers Management and Protection Program.

As amended, SB 218 focuses on Class B sewage sludge because it contains more harmful contaminants than Class A.

**WHY SURFACE WATER PROTECTION IS NECESSARY**

Sewage sludge is not a uniform product. Its quality and constituents vary from week to week, even in sludges from the same wastewater treatment plant. As a result, a reliable risk assessment on the long-term impact of the effect on water quality and aquatic organisms from land applying sewage sludge is not possible. Contaminants in sludge interact with one another to produce new substances.

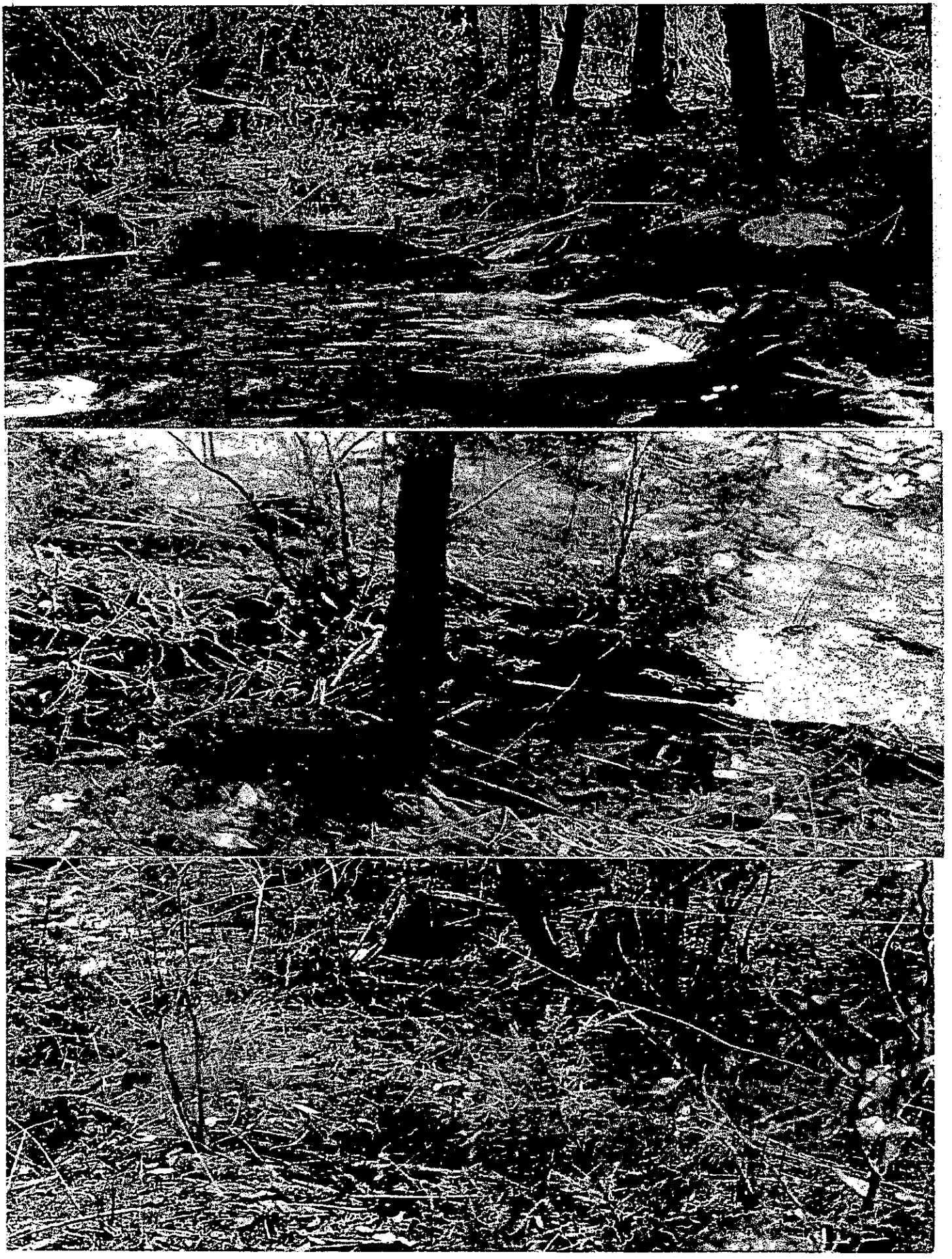
The common sense approach is to be cautious in how sludge is used. The new sludge rules, however, are designed to encourage the use of sewage sludge. Buffer distances between sludge applications and surface waters under the new sludge rules range from 125 feet down to no more than 75 feet. The DES rationale is that vegetation and management of land application activities within the buffer zone have a more protective effect than does distance.

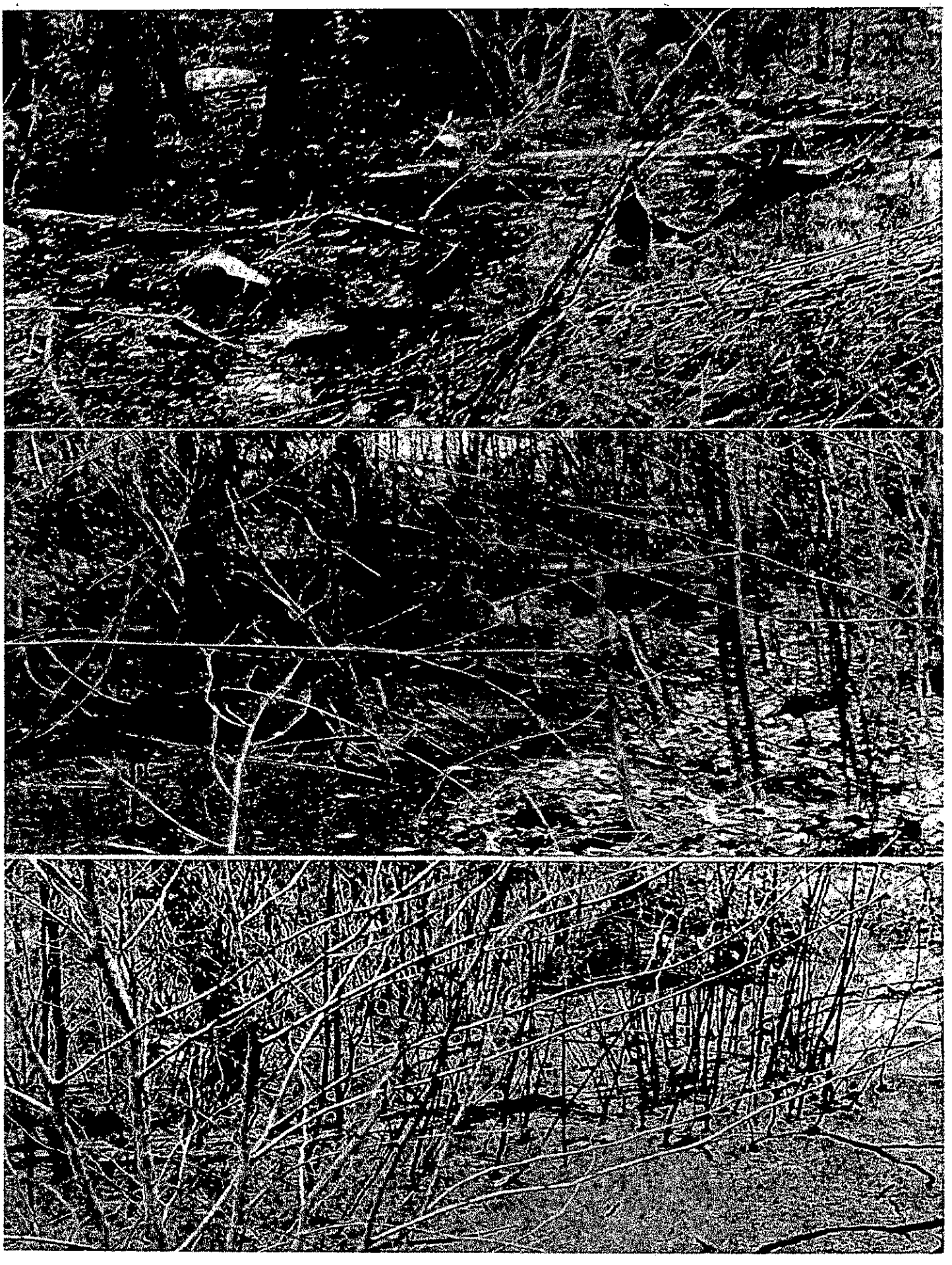
**DEERFIELD PHOTOGRAPHS**

The enclosed photographs show a sludge stockpile in Deerfield, New Hampshire. The sludge was stockpiled in the spring approximately 200 feet from a very lovely stream. There is quite a bit of vegetation. The slope from the stockpile to the stream is minimal.

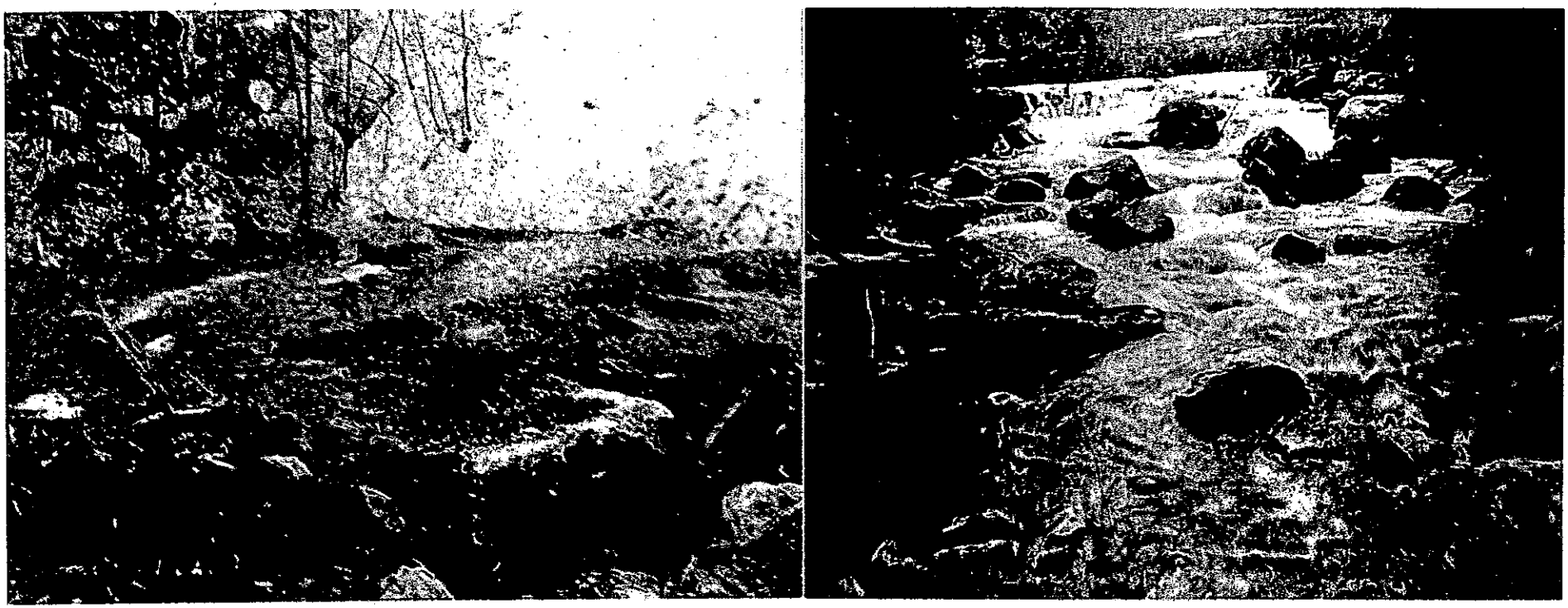
Under the new rules, and the DES rationale, this sludge should not cause any environmental problems. It meets the requirements for land application near surface waters. As you follow the trail of the sludge, however, you can watch it flow into the stream and pollute the water.

As these photographs show, a 250 foot buffer distance is not an unreasonable requirement.









SIERRA CLUB
FOUNDED 1892

# SEWAGE SLUDGE in New Hampshire: Questions and Answers

**Q: WHAT IS SEWAGE SLUDGE?**

**A: The *HarperCollins Dictionary of Environmental Science* defines sludge as a "viscous, semisolid mixture of bacteria-and virus-laden organic matter, toxic metals, synthetic organic chemicals, and settled solids removed from domestic and industrial waste water at a sewage treatment plant."**

**The chemical composition and biological constituents of sludge depends upon the composition of the waste water entering the treatment facilities. Typically these may include volatiles, organic solids, nutrients, disease causing pathogens, toxic heavy metals, toxic organic chemicals from industrial wastes, household wastes and pesticides ( EPA statement in the Federal Register). Many of these chemicals are carcinogens.**

**In addition, 3,000 Nuclear Regulatory Commission licenses and about 4,000 state permits are issued annually to industries who discharge radioactive material ( including plutonium) into sewage treatment plants. Ironically, sewage sludge is not regulated or monitored for radioactivity.**

**Q: ISN'T SLUDGE TREATED TO REMOVE HARMFUL CONTAMINANTS?**

**A: Yes, to varying degrees. Lime is added to Class B sludge for pathogen and vector attraction reduction. Class A sludges are heated to further reduce pathogens. But some viruses can survive these treatments and leach into ground water. Also, lengthy stockpiling of sludge encourages bacterial re-growth. There is no treatment to remove toxic metals, and many toxic organics, and other harmful chemicals that are known to concentrate in sludge.**

**Q: DOESN'T NEW HAMPSHIRE REQUIRE INDUSTRIES THAT USE MUNICIPAL SEWER SYSTEMS TO PRETREAT THEIR WASTE WATER?**

**A: Only 225 out of NH's approximately 4,000 industrial facilities have pretreatment programs. Under current state pretreatment rules, each industry is allowed to dump up to 33 pounds of hazardous waste each month into the sewer system with no penalty. NH Waste Management Rules clearly state that " Wastewater discharges in compliance with applicable state and federal permits can become hazardous waste when the wastewater yields sludge from a water treatment plant."**

**Q: DOESN'T THE NEW HAMPSHIRE BUREAU OF HEALTH RISK ASSESSMENT SAY THAT TOXIC CHEMICALS IN SLUDGE EXIST IN SUCH LOW CONCENTRATIONS THAT THEY POSE LITTLE RISK TO HUMAN HEALTH AND THE ENVIRONMENT?**

**A: Many scientists would disagree with this assumption. The hormone disrupting chemicals in sludge such as DEHP, dioxins, PCBs, lead, mercury, and cadmium can damage fertility and developing fetuses at extraordinary low doses, measured in parts per trillion. The**

[redacted]. The health risks from these chemicals can not be assessed using the classic linear dose-response model that informs traditional toxicology.

**Q: ARE FEDERAL RULES(THE EPA 503s) PROTECTIVE OF HUMAN HEALTH, THE ENVIRONMENT, AND LONG TERM AGRICULTURAL PRODUCTIVITY?**

**A: No. The US sludge rules are the least stringent of any in the industrialized world. They are based on a flawed risk assessment of only nine of the thousands of contaminants found in sludge. Cornell University's Waste Management Institute's *The Case For Caution*, a well researched critique of the federal 503 regulations, concludes that federal land application laws are not protective, especially in the northeastern states. Many other scientists agree. In fact, most of the EPA scientists who worked on the federal rules agree that the 503s are based on flawed science. But their concerns that "American farmlands would turn into low level hazardous waste sites" were ignored by Washington administrators. "The science underlying the 503s is so faulty," says one EPA scientist, " that it was referred to in official communications as "sludge magic."**

**Q: WHAT ABOUT THE STATE LAWS?**

**A: These, too, appear to be driven by economics rather than by common sense and sound science. Just as EPA administrators ignored their own experts, NH Department of Environmental Services seems to ignore the advice of many state scientists and consultants. Because northeastern states have acidic soil, high water tables, cool climates, and frequent precipitation, land application needs to be done very cautiously, New Hampshire's neighboring states realize this. Yet current state laws permit sludge on flood plains and dairy pastures, long term stockpiling, and excessive amounts of Class B sewage sludge and industrial paper mill sludge on aquifers.**

**Q: ARE THERE DOCUMENTED CASES OF HARM TO PEOPLE, LIVESTOCK, OR THE ENVIRONMENT FROM SLUDGE SPREADING?**

**A: There are hundreds of sludge victims nationwide. People and livestock have been harmed, drinking water has been contaminated, land rendered unusable. Most of these cases are not "documented" because of out of court settlements, because federal and state agencies often ignore complaints, or because complaints are not investigated adequately. Also, state health departments often do not have the resources or expertise to diagnose the kind of health problems linked to sludge activities. Apparently the regional EPA offices have received so many sludge complaints since 1993, they are asking $42,000 for a complete set of these records.**

**Q: WHAT CAN CITIZENS DO ABOUT THE RISKS OF SLUDGE?**

**A: They can contact their state legislators requesting more protective sludge regulations. They can petition their town officials to enact protective sludge ordinances. They can request a copy of *The Case For Caution* and other recent, science-based information about land application of sludge from the following groups:**

**Citizens for a Future NH**
**(603) 284-6998 or**
**(603) 875-3842**

**NH Sierra Club**
**(603) 224-8222**

**NH Clean Water Action**
**(603) 430-9565**

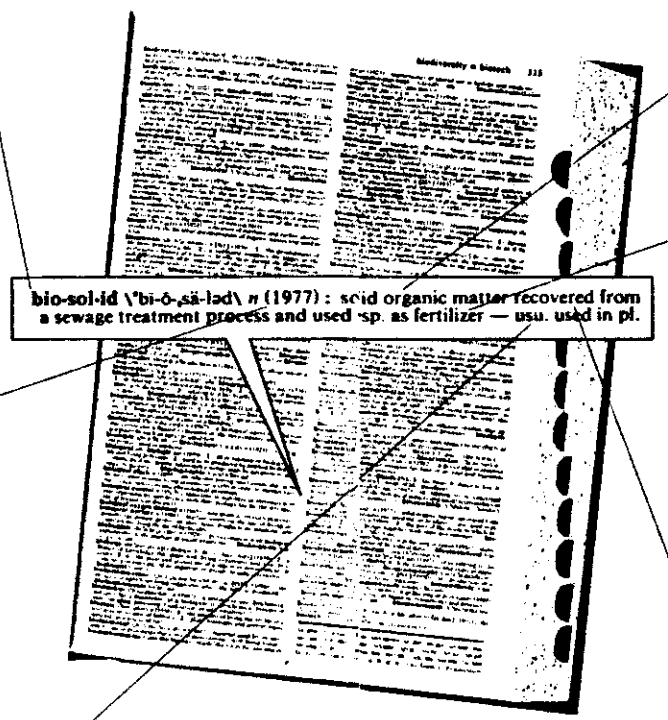
# LET THEM EAT NUTRI-CAKE

## Merriam-Webster thinks our "biosolids" don't stink, *by Sheldon Rampton*

How do words make it into the dictionary? According to the preface to the 1998 edition of Merriam-Webster's Collegiate Dictionary, in which this definition of "biosolid" appears, editors read newspapers, books, and magazines in a continuous search for new words, spellings, and meanings. When a new word has appeared in a number of publications, over a sufficient period of time, a "definer" then makes a judgment as to whether the word warrants inclusion. Dictionary editors try to write definitions that reflect what a word means as it is actually used, says the preface, "rather than what the definer or someone else thinks it ought to mean, and they want their definitions to be accurate, clear, informative, and concise." In other words, "authoritative." We readers expect that, after all. "Biosolid" appears in Merriam-Webster's for the first time this year. How did it get there? And is its definition "accurate," "clear," and "informative"?

Merriam-Webster dates "biosolid" to 1977 based on a single occurrence of the word at a conference of paper-mill operators, a usage that has nothing to do with the word's current definition. The true origin of "biosolid" can be traced to a Name Change Task Force created by the sewage industry to improve the image of its main product, sludge. In 1990, the task force sponsored a contest to come up with a more marketable name. Rejected candidates include "all growth," "purenutri," "biolife," "bioslurp," "black gold," "geoslime," "sca-doo," "the end product," "humanure," "hu-doo," "bioresidue," "urban biomass," "powergro," "organite," and "nutri-cake." In 1991, the task force settled on "biosolids," a word chosen, in good Orwellian fashion, for its positive, reassuring connotations. The sewage industry then began a public-relations campaign to place "biosolids" in the dictionary. Merriam-Webster science editor Michael Roundy acknowledges the campaign, but he argues that "entries are not based on the mere existence of a word. They're based on common usage."

The public-relations campaign to greenwash sludge entailed using the word "biosolids" instead of "sludge" wherever possible. In 1992, the Environmental Protection Agency chipped in a $300,000 grant to "educate the public" about the wonderful qualities of sludge, part of which went to Powell Tate, a blue-chip Washington public-relations and lobbying firm. By 1998 the campaign had dropped the term "biosolids" into hundreds of newspaper and magazine articles. It also included letters to Merriam-Webster from sewage-industry representatives such as Peter Machno, who manages Seattle's sludge-to-fertilizer program. "It looks like we are making progress on getting it included in a future edition," Machno wrote in a 1994 letter to Paul Cappellano, an editor at Merriam-Webster. "I am pleased that the term sludge will not appear in the definition."



**bio-sol-id** \'bī-ō-ˌsä-ləd\ *n* **(1977) : solid organic matter recovered from a sewage treatment process and used sp. as fertilizer — usu. used in pl.**

*Sheldon Rampton is the co-author, with John Stauber, of* Mad Cow USA *and* Toxic Sludge Is Good for You, *and an associate editor of* PR Watch (www.prwatch.org), *an investigative quarterly.*

Although a sewage-industry publicist did not actually write this definition, it is everything the industry hoped for. "Organic," in its current quotidian usage, sounds wholesome, fresh, pesticide- and chemical-free. Sewage sludge, however, is far from being fully organic, even in the most technical sense. It is the by-product of both household and industrial waste, and even after "treatment" may contain thousands of pathogens and toxic chemicals, including PCBs, DDT, dioxins, and salmonella—not to mention lead, mercury, polio and hepatitis viruses, parasitic worms, asbestos, and radioactive waste. Nor is it always solid. In fact, it is often a viscous and semisolid gray jelly. And it stinks.

When sewage executives, who typically work for municipal agencies and government contractors, talk about fertilizer, they always use the phrase "beneficial use," industry jargon for spreading sludge on farms. Faced with rising sludge-disposal costs, the EPA began to advocate "beneficial use" policies in the 1970s, long before "biosolids" was invented as a euphemism. The sewage industry resisted at first, and in 1977 Robert Canham, director of the industry's Water Environment Federation (formerly known as the Federation of Sewage and Industrial Wastes Associations), criticized the EPA's enthusiasm for sludge farming, which he feared could introduce viruses into the food chain. By the early 1990s, as the industry ran out of disposal options, the WEF was actively marketing sludge to farmers as cheap fertilizer—so cheap, in fact, that it is generally sold at a loss or given away. New York City, for example, has paid over $126 million for the privilege of "fertilizing" a ranch in Sierra Blanca, Texas, with mountains (400 tons a day) of toxic sludge.

"Recovered" evokes healing, rebirth, a return to normalcy, as when one speaks of an environmentally devastated biosystem that has recovered its biodiversity. The sludge industry is trying to recover from its own environmental setbacks (the 1988 ban on ocean dumping, for example) by making the beneficial use of biosolids "non-controversial by the year 2000," as an industry strategy memo put it, saving perhaps as much as $5 billion a year in disposal costs. Thousands of city governments, along with the EPA, are thus leveraging the fiction that spreading 4 million tons of sewage sludge on farms every year is as ecologically responsible as recycling our newspapers. In 1992, the EPA rewrote its regulations for the application of "biosolids" to farmland and shifted its classification from solid waste, considered hazardous to human health, to "Class A" fertilizer. Farmers in forty-six states are using sludge on a wide variety of food crops, and last year the USDA even drafted regulations that would permit the use of sludge as fertilizer on "certified organic" foods. "Biosolids," having entered the language as well as our water and food supply, give new meaning to the phrase "full of shit."

# The Community School

Perkins Farm
1164 Bunker Hill Road
South Tamworth, NH 03883-4170


Testimony before the NH House
Resources, Recreation and Development Committee
For amendment of HB 546-FN-A
March 2, 1999

My name is Martha Carlson, I am director of The Community School in Tamworth. We own a 300 acre farm abutting one of the Ambrose Brothers gravel pits. I am a certified well operator under the NH DES and test our school well for 65 different elements and compounds on a regular basis. I am concerned that the spreading of any municipal sludge or paper co. waste materials on the Ambrose pits will travel through the aquifer and come up in my well.

I would like to recommend that you amend this bill to allow for other types of research on reclamation of sand pits. I am particularly interested in reclamation using organic plants.

It seems pretty obvious to me that nitrates can and will travel through ground water. Any high school chemistry student knows that salts dissolve in water. And salts increase the effectiveness of a liquid electrolyte. Nitrates from sludge will dissolve in ground water easily. And they'll make it easier for water to transport heavy metal ions.

I object strenuously to the use of sludge on the sand pits. The pits near my school are dug down to or into the ground water. That is why the pit operator stops digging: water floods his operation. At the Ambrose pits, I can stick my finger into the sand and find a seepage of water. Pools dot the surface of the pit floor, open windows to the ground water below. The sand is a gigantic sponge, saturated with water most of the year. Anything we put on that sand will dissolve with rainwater and snow and travel into that ground water, which my students and my neighbors and I drink.

So I've been interested in alternatives. Mr. Robert Ambrose has agreed to work with my school to explore alternatives. We could use research support. We know that pines and other conifers can thrive on this land. Mr. Ambrose and others have reclaimed pits with trees for years, with success. My students and I helped reclaim the Sandwich Town dump with pines years ago and those trees now are a thick forest on pure sand and gravel.

We are hoping to explore other income-producing options. Wild cranberries grow on


Phone: (603) 323-7000 E-Mail: bearcamp@ncia.net FAX: (603) 323-8240

one of the Ambrose pits. Cranberries are a potential agricultural product for this pit and many others in NH. The Cape Cod cranberry barrens are in danger today because of ground water pollution. The wild species in NH may be resistant to some cranberry blights. We'd like to learn whether it would be feasible to grow these plants commercially. We'd like to explore also high bush blueberries which, as every NH canoeist knows, love having wet feet.

A small grant such as your research funds would allow us to conduct the preliminary fact finding we need just to apply for larger federal grants. The U.S. Dept. of Agriculture might be interested in a research grant under their Sustainable Agriculture Research and Education program. At this point, I hope to hire a summer horticulture major from UNH to build that grant application. We need to know how many acres of cranberries are already there, what species are they, what brush removal will be required, how much earth moving might be needed. We need to interview Commissioner of Agriculture Steve Taylor to find out whether there are farmers in this area who might be interested in a new crop, whether farmers such as the Gilmanton Iron Works blueberry farmers would have equipment available in the fall for cleaning and packaging a new berry crop. These are simple questions but ones which are essential to answer before we engage in a trial growing project. Your small grant would be ideal for such exploration.

The sand pits in my area, Tamworth, Ossipee and Madison lie atop the Ossipee aquifer, an underground reserve of water supposedly large enough to serve all of metropolitan Boston. It is imperative that we guard this resource carefully. Nitrates, nitrites, heavy metals and petroleum compounds, all found in sludge, could cause permanent damage to this treasure. Any pit operator would be delighted to choose an alternative reclamation action which would bring him the community's support and applause rather than suspicion and fear. Your grant might open the way to proving that planting trees or growing cranberries are viable options to sand pit reclamation.

Thank you.

# Sludge Magic: EPA Spreads E. Coli

*by David L. Lewis, Ph.D.*

According to scientists working for the Environmental Protection Agency's Office of Research & Development, the Sludge Rule on land application of municipal wastes (40 CFR Part 503) promulgated in 1993 may be the most scientifically unsound action ever taken by the agency. Rather than being protective, the rule actually threatens public health and the environment.

In short, EPA's sludge rule permits land application of dried urban sewage—called "sludge"—in lieu of dumping it in the ocean, which is now prohibited. About half of the sludge from municipal waste treatment facilities across the U.S., containing human sewage, agricultural runoff and industrial wastes, is now being used to fertilize farmland, national forests, and other areas. This amount is rapidly increasing as states and waste disposal companies pressure local communities to use sewage sludge and assure the public that the EPA has determined it to be virtually risk-free.

*"Rather than being protective, the rule actually threatens public health and the environment."*

In 1972 Congress amended the Clean Water Act directing EPA to develop regulations for disposing of sewage sludge. A U.S. District Court in Eugene, Oregon followed suit in 1990, issuing a consent decree requiring the agency to promulgate the regulations within two years.

Remarkably, the agency's position on this issue reveals a sort of environmental doublespeak—traces of pesticides, heavy metals, and industrial wastes that environmental officials have long argued cause cancer and other major public health problems—are now said to be completely safe for disposal on farmlands, forests, even home lawns and gardens.

The science behind EPA's sludge rule, according to some of the agency's own scientists who reviewed it, was so bad it was popularly deemed "sludge magic" [See EPA Magic, next page]. Because sludge contains human pathogens and trace quantities of mercury, lead, and other toxic metals, applying it to areas used for growing food crops and selling bags of it to home gardeners is a source of concern. Ecologists also have reservations about the effects of nutrients, toxic metals, and other pollutants leaching from sludge into surface and groundwater.

*"Content that syringes and rubber gloves no longer litter our beaches, few policymakers and reporters seem even slightly curious about how our government solved the problem of ocean dumping of municipal wastes."*

Indeed, government researchers in Canada collaborating with scientists at the University of Quebec last year published a study showing that forests treated with sewage sludge released toxic metals in amounts that exceeded water-quality criteria for protecting aquatic organisms.

Disease-causing microorganisms that can lie dormant or proliferate in soil treated with sludge are even more disconcerting to microbiologists. Samples taken this year from land in north Kansas City contained 650,000 salmonella and E. coli bacteria per 100 grams of soil - many thousands of times higher that what is considered safe by public health officials. The source, apparently, was sludge applied in the area before 1992.

The appearance of new strains of staphylococcus, tuberculosis, E. coli and other bacteria—some of which are completely resistant to modern antibiotics—has led to a resurgence of life-threatening infections that were once easily treated. Spreading sludge, which contains such superbugs flushed down hospital sewer lines, on farms and home gardens throughout the U.S. has scientists both inside and outside of EPA understandably concerned.

With increasing numbers of children dying from E. coli strain O157 traced to an assortment of products, including strawberries and hamburger meat, citizens are becoming increasingly concerned over agricultural products imported from less developed areas of the world where human waste serves as cheap fertilizer. Content that syringes and rubber gloves no longer litter our beaches, few

policymakers and reporters seem even slightly curious about how our government solved the problem of ocean dumping of municipal wastes.

Still, it is what EPA's sludge rule says about many of the agency's other regulations that seems most enigmatic. When asked why pesticides, organic solvents, toxic metals and other pollutants in sludge pose virtually no risk to public health or the environment, agency officials point to a lack of documented cases of anyone becoming sick from exposure to sludge. Critics argue that the same can be said of traces of pesticides and other industrial chemicals in drinking water. EPA's position on sludge, they say, shows that agency regulations are often based on political expediency, not sound science.

*"It is what EPA's sludge rule says about many of the agency's other regulations that seems most enigmatic."*

**EPA MAGIC**

| Concerns | EPA "Magic" | Scientific Facts |
|---|---|---|
| Toxic metals, such as lead, cadmium, and mercury in sludge present a threat to public health from direct exposure and from uptake by food crops. | Metal contaminants are permanently bound to organic matter in sludge and cannot be taken up by plants or released to expose humans and animals. Only material with very low levels of toxic metals are permitted for land application. | Changes in pH, activity of soil microorganisms, and other soil processes can cause metals to be released. With no monitoring required and no limits set on maximum concentrations that can accumulate, metals will reach toxic levels after repeated applications of sludge. |
| Human pathogens in sludge can infect workers handling the material, people living in or around areas where sludge is applied, and consumers who eat crops grown on contaminated land. | Sludge is treated to reduce numbers of pathogens to safe levels. Any remaining pathogens die within 30-60 days after land application.<br>No case of disease from exposure to treated sludge has ever been documented.<br>Similar use of cow manure has not created public health problems from pathogens. | Approximately one third of the population including infants, the elderly, people with chronic diseases, patients on chemotherapy, and people with AIDS are susceptible to low levels of pathogens. Bacteria, such as *E. coli*, can remain dormant in soil for years. |
| Land application of human waste will spread antibiotic-resistant microbes throughout our environment and bring them in direct contact with the food supply. | Manure from farm animals treated with antibiotics is already widely applied to farmlands. | Specific sources of sporadic infections are rarely traced.<br>Few diseases are transmitted from cows to man. All pathogens in human waste can potentially infect other humans.<br>Human wastes, especially originating from hospitals, contain microbes resistant to antibiotics that are our last line of defense against tuberculosis and other major diseases. |

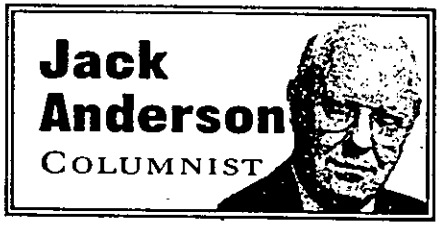
*Dr. Lewis has a Ph.D. degree in microbial ecology, works as a research microbiologist for the U.S. EPA Ecosystems Research Division, and is an adjunct scientist at the University of Georgia.*

***DISCLAIMER: These comments represent Dr. Lewis' personal views, not official policies of the U.S. EPA.***

# Govt. Fails to Regulate Sludge Dumping

EDITORIAL
JAN. 2, 1999
The Citizen, Laconia, N.H.

WASHINGTON




Like many places in the late 1970s, the city of Augusta, Ga., had a problem: millions of gallons of sewage sludge and nowhere to put it. And like many cities, Augusta turned to the easiest, cheapest solution: spreading it on farmland.

Augusta city officials targeted two dairy farmers, R.A. McElmurray, Sr. and Hugh Boyce, for sludge dumping.

Like all sludge, the Augusta variety was produced by running whatever was dumped into the city's sewer through a series of settling pools and chemical treatments. The treated water is discharged, leaving a highly concentrated sludge of industrial byproducts and human waste that has creatively been labeled "biosolids."

The dairymen accepted vast quantities of "biosolids." McElmurray took more than 71 million gallons through 1990, and Boyce took 23.4 million.

Around 1986 both McElmurray's and Boyce's farm managers began noticing some disturbing things: the leaves on their feed crops were twisted and the roots weren't forming properly. Their cattle were losing weight, giving less milk and their mortality rates were slowly rising.

After carefully eliminating a range of possibilities, McElmurray attributed the farm's problems to the sludge and canceled his sludge contract in mid-1990. But city officials didn't miss a beat. They brazenly tripled the amount of sludge they dumped on Boyce's property while they scrambled to secure new dumping grounds.

By 1993 Boyce's herd and land were being ravaged. Mortality rates had quadrupled from 1980 and annual milk production had dropped significantly. Things continued to spiral downward as herd managers ruled out one possible cause after another. By early 1998 the herd's mortality rate was approaching 30 percent. Finally, Boyce canceled his sludge contract.

Soil samples from McElmurray's and Boyce's farm support what the dairymen had already concluded: the city's sludge was toxic, laden with high concentrations of heavy metals, volatile organics and petroleum byproducts.

Boyce and McElmurray have filed a suit against the city in federal district court. When we asked Augusta city officials to respond to the allegations, we were told "our comment is no comment."

A growing number of anti-sludge activists say stories like Boyce's and McElmurray's are evidence that the spreading of sewage sludge is nothing but a way for government officials to escape liability for a highly concentrated toxic waste.

Former chemistry professor Stanford Tackett describes sludge spreading as "a scam of enormous proportions, driven mainly by money."

The greatest danger of sludge dumping, experts say, is that no one really knows what's in it. Among the more disturbing facts uncovered by the Augusta lawsuit is that the city was allowing extensive after-hours dumping. In a Feb. 13, 1995 memo, the city's director of Water Pollution Control acknowledges that "currently haulers who dump after normal business hours are on the honor system, and we have no control over what might be introduced to our plant."

Pat Costner, who owned and operated a small wastewater analysis lab before taking her current job with Greenpeace, told our associate Ashley Baker that "very few industries know what's in their discharge. They will know fairly broad parameters, but they won't know every chemical that's in there. If a city has a pretreatment program, it will only address a fairly limited number of chemicals."

Another problem is that government agencies require relatively few companies to treat their waste before sending it down the drain. The New York City Department of Environmental Protection, reported that as of March 1994, there were 93,900 establishments of "possible concern" dumping dangerous and toxic substances down the drain. But in the end, the Department identified only 1,141 that "needed regulation."

Even regulated companies are suspect. A 1993 EPA report found that 54 percent of the 30,000 industrial users nationwide were in "significant non-compliance with pretreatment limits or reporting requirements, or both."

*Former chemistry professor Stanford Tackett describes sludge spreading as "a scam of enormous proportions, driven mainly by money."*

But rather than cracking down on such practices, the EPA has orchestrated and funded a massive public relations program to "educate the public" about the "beneficial uses" of sludge.

We were surprised to learn that the EPA's top sludge regulator, Alan Rubin, had been loaned to the Water Environment Federation, the sludge industry's lobbying and public relations arm in 1995 while EPA continued to pay half his salary.

Rubin's response to our questions about the dangers of sludge was predictable. "In all of the years I have worked on this, I've never seen a documented case (facts are gathered, report is written and peer reviewed by qualified scientist) of a human getting sick from or a animal dying from biosolids or exposure to biosolids."

Does this sort of narrow answer remind you of anything else going on in Washington right now?

*Jack Anderson is a syndicated columnist*

# Sewage industry plays semantics

"When I use a word," Humpty-Dumpty famously noted to Alice in "Through the Looking Glass," "it means just what I choose it to mean – nothing more nor less."

Perhaps that may explain why President Clinton continues to debate the meaning of the word "is." And it may also have helped the American sewage industry talk thousands of farmers into spreading industrial waste on their land.

A massive public-relations campaign, cooked up by the sewage industry and endorsed by the federal government, has literally redefined the meaning of sewage sludge. The waste we pour down our toilets is now called "biosolids." And it's being sold to farmers as a safe and inexpensive way to fertilize their fields.

What most people may not realize is that this biosolid fertilizer also contains toxic compounds and metals, industrial wastes – and, in some cases, radioactive elements.

Some background: When you flush your toilet, the waste is transported to a sewage treatment plant, where it's mixed with other human waste and industrial byproducts. This fetid brew then undergoes a complex treatment process that eventually results in biosolids, which are subsequently peddled to your local farmer.

Officials at the Environmental Protection Agency say that treated, properly applied sludge is perfectly safe.

But others – inside and outside EPA – aren't so sure. They claim the regulations don't cover a significant number of destructive elements and chemical compounds – and allow others to exist in unacceptably high levels.

Take, for example, cadmium. Denmark limits cadmium in sludge fertilizer to less than one part per million, and Germany allows 10. In New York, it's 25 parts per million. But the EPA will allow up to 39.

"There is no technology at the waste treatment facilities to detoxify the industrial wastes," says Hugh Kaufman of the EPA's Hazardous Site Control Division. "The only technique is to de-water or concentrate what's left into a sludge. The more you treat it, the more toxic it becomes."

And Stanford Tackett, a retired university chemist, says the EPA's aggressive marketing of sludge-as-fertilizer is motivated by the agency's disposal problem.

In the early 1970s, the EPA found that the most economical way to deal with the influx of sewage sludge, at least for coastal cities, was to dump it into the ocean. But in 1988, Congress made ocean-dumping illegal. The next cheapest alternative was to spread it on land.

"The land-spreading program for sewage sludge is a scam of enormous proportions, driven mainly by money," said Tackett. "The high sounding justifications such as 'sludge is a beneficial resource' and 'sludge is just as safe as manure' are clever excuses designed to fool the public. In truth, only 1 to 3 percent of sludge is useful to plants."

One solution would be to use separate systems to treat human and industrial waste. Another idea is to start using dry toilets that compost waste instead of flushing it – an idea we guess wouldn't sit well with most Americans.

Besides, building sewers is big business. The EPA estimates that $140 billion will be needed over the next 20 years to expand and maintain the existing $1 trillion network of sewers and treatment plants.

"Politically speaking, you have powerful forces that want to build sewers, much like the military-industrial complex," one EPA official told our associate Ashley Baker.

Despite the so-called benefits, EPA officials realized early on that sludge would be a tough sell to the general public.

Its first step was to strike the words "sewage sludge" from the public record. In early 1991, the sewage industry's trade group held a contest to rename sewage sludge, finally settling on "biosolids."

Shortly after the name made its debut, the trade group changed its name from the Water Pollution Control Federation to the nicer-sounding "Water Environment Federation." Pretty soon, the newly renamed group had a $300,000 grant from the EPA to "educate the public" about the "beneficial uses" of biosolids.

The WEF also retained the services of Powell Tate, a Washington lobbying firm. Even Powell Tate struggled. "The WEF is in the delicate position of having to sell a new product that is accompanied by a questionable history," states a 1993 internal memo. Powell Tate declined our request to elaborate on what they meant by "questionable history."

The success of the campaign has been qualified at best. Heinz foods and Del Monte, for example, have been refusing to use sludge-grown products for years.

Says a spokesman for Heinz: "Most consumers expect that their products have been grown in soil, period. We can't run the risk of selling consumers products of questionable content."




By JACK ANDERSON and JAN MOLLER
United Feature Syndicate

Attachment BB

May 6, 1999

To: Richard Russman, Chair; Senate Environment Committee

From: Wendy S. Lannon, M.S., R.N.

Re: Testimony in support of Senate Bill 218, as amended

Mr. Russman and members of the committee, I thank you for the privilege of providing testimony in support of Senate Bill 218 as amended. Although I am unable to present my testimony in person today, I am compelled to submit a statement in writing by my concern over the public health implications of the contaminants found in sludge.

I first became aware of the sludge issue when I read an article written by DeeDee O'Rourke, also an R.N. in New Hampshire, which was published in the NH Sierra Club newsletter. I was alarmed by the list of contaminants in sludge because at the time, I was in my nursing program and was studying the negative human health effects of these toxics. To be specific, I am referring to metals (e.g. arsenic, lead, mercury), hormone disrupting chemicals (e.g. PCBs, Dioxin), and pathogens (e.g. bacteria, viruses). The language of the amendments to sections 5-e and 5-f of SB 218 address directly the first two categories of contaminants, while section 5-d as introduced addresses the third category indirectly.

The amendment of section 5-e sets low metal limits as the standard, and is crucial to prevent possible metal toxicity to both animals and people. With respect to the amended limits of arsenic, a known human carcinogen and a potent hormone disrupter, the NH Bureau of Health Risk Assessment made the very same recommendations, and in general proposed that maximum metal limits be set to the 99$^{th}$ percentile of levels in NH sludges. The original language of SB 218 describes a category of "all other sludges" having unacceptably higher allowable limits of toxic metals. As a nursing student, I did a rotation at Home Health VNA in Andover, MA, which served inner city neighborhoods in Lowell and Lawrence where lead poisoning in children is still a problem. Lead poisoning causes severe neurological deficits, mental retardation, and death; according to the CDC, blood levels in children greater than 10 microgram/deciliter are considered toxic. Lead poisoning is also a problem among the elderly in these areas. It is entirely possible that land applying sludge containing the higher allowable limits of arsenic, lead, and the other metals known to be harmful to both humans and livestock, could increase the risk of serious health problems. I support the amendment to section 5-e that would remove the "all other sludges" category and make low metal limits standard and not voluntary. The language of SB 218 as introduced regarding maintenance of soil pH between 6.5 and 7.0 is

an important adjunct to prevent the mobilization of metals from soil to groundwater or plant matter, a problem caused by acidification of soil.

The amendment to section 5-f addresses the organochlorine dioxin, known to be the most potent animal carcinogen ever tested and also a potent endocrine hormone disrupter. Dioxin is a persistent chemical that bioaccumulates in adipose tissue at the top of the food web (i.e., in humans and livestock). While in nursing school, I interviewed Beverly Pagan of the Jackson Laboratory in Bar Harbor, ME, who told me that dioxin is found in the highest concentrations in beef, up to 4-5 times that of other animal sources, and in dairy milk. It is also found in human breast milk, so that a lactating woman passes on her lifetime dioxin burden to each of her children. Dioxin, PCBs, and other organochlorines that are used as pesticides "mimic" estrogens and androgens and cause reproductive abnormalities (e.g., decreased sperm counts, abnormally developed internal and external reproductive organs), neurological/behavioral abnormalities (e.g., impaired learning, hyperactivity), immunosuppression, and increased cancer incidence (e.g., prostate, breast, testes). Not only do these effects occur with very low concentrations of the compound (e.g., 1 part per trillion for dioxin), but the compounds act synergistically, a serious potential hazard of sludge containing combinations of dioxin, PCBs, furans, and pesticides. I know of no research proving that sludge containing these hormone disrupters has caused health problems related to endocrine disruption, but there is enough evidence in other sectors to support a prudent, preventive approach with the land application of sludge and more strict regulations thereof. From a nursing perspective, I support the amendments of section 5-f dealing with sludge containing dioxin, and section 5-e, which removes the category "all other sludges", which contain PCBS, furans, and other organochlorines.

Finally, although SB 218 does not address directly the pathogens known to be in sludge, the language pertaining to stockpiling is important in that there is a potential for regrowth of pathogens in stockpiles stored in cooler climates. Although sludge is treated to remove pathogens, the only way to destroy them completely is through incineration, in itself a problem due to airborne contaminants. Bacteria such as E.coli can persist in soil for years, and other bacteria, such as the genus Clostridium, produce endospores that render the bacteria impervious to chemicals and extremes of temperature. Of major concern in health care today are multi-drug resistant organisms, such as tuberculosis, methicillin resistant Staph aureus, and vancomycin resistant enterococci These organisms are becoming or have become resistant to our last line of antibiotic defense and are routinely a part of hospital waste that enters municipal wastewater treatment facilities. The State of NH Dept. of Health and Human Services, Office of Health Management stated in their report, *Land Application of Sewage Sludge and Human Health,* that biosolids, the euphemism for sludge, "contains pathogens similar to those found in animal manure." Nothing could be further from the truth. The pathogens I just described are not found in animal manure, and despite the fact that antibiotics are routinely used in animal feed, etc., creating in consequence bacteria resistant to them, very few pathogens that infect animals are passed on to and infect humans. Disease-

causing pathogens in humans, both multi-drug resistant and sensitive, even in low concentrations, could have serious implications for immunocompromised individuals, children, the elderly, etc. This is simply one more reason to support more stringent regulations of the land application of sludge, as in the amended SB 218.

In closing, I would like to state the obvious, that I am not a chemist or a microbiologist; I am a nurse and a health care provider with knowledge of these disciplines pertinent to my scope of practice. SB 218 as amended is an important step toward more strict regulation of land applying sludge that will protect livestock and the environment, and minimize risks to public health. Therefore, as a concerned health care professional and a lifelong NH resident, I respectfully submit my support of SB 218 as amended.

Thank you very much for this opportunity.

Sincerely,

Wendy S. Lannon, M.S., R.N.
Exeter Hospital, Exeter, NH
Residence: 516 Winnacunnet Rd., Hampton, NH

I would recommend the following as sources for information I addressed and for further emphasis on the importance of passing SB 218 as amended:

*Land Spreading of Sludge: Report of the UNH Task Force, UNH Cooperative Extension, Sept., 1998* (addresses health risks of land applying sludge).

*Our Stolen Future, by Theo Colboum, Diane Dumanoski, and John Peterson Myers, Dutton Publishing, 1996* (addresses hormone disrupting chemicals such as dioxin, PCBs, etc.).

*Short Term Solutions for Making Land Application of Sludge Safer in NH, by Caroline Snyder, Citizens for a Future New Hampshire, March, 1999.*

Attachment CC

TO THE SENATE COMMITTEE ON THE ENVIRONMENT - MAY 6, 1999

The waste industry and DES say landspreading sludge is recycling. How do you recycle arsenic, cadmium, lead, mercury, cyanide and toxic organic hormone-disrupting chemicals which are wreaking havoc in aquatic and terrestrial ecosystems?

Last year New Hampshire residents were promised the strictest sludge rules in New England. We got fooled.

Vermont has very protective rules about sludge on flood plains -- depending on the height of the river bank. And they require prompt incorporation into the soil. NH allows sludge within 125 feet of rivers, even on flood plains, and no incorporation is required. Do you remember the floods last June when rivers all over the state overflowed their banks?. Any sludge on those flood plains floated right into the rivers.

Maine doesn't allow spreading of anaerobically digested sludge on farmland because of the pathogens. NH encourages landspreading of anaerobic sludge from Franklin and Brattleboro, Vermont.

Vermont has strict rules requiring waterproof coverings and protective berms around sludge stockpiles so no pathogens or toxins can leach. NH rules have no such requirements. Vermont limits paper mill sludge to 5 dry tons an acre -- about 15 to 20 wet tons. New Hampshire is the only state in New England spreading paper mill sludge at rate of 550 tons per acre.

Massachusetts requires a setback of 2500 feet from any Class A water. Maine requires a sludge setback from ponds, lakes and streams of 300 feet. Only NH allows sludge spreading within 125 feet of all our surface waters.

Norway, Denmark and Sweden do not allow animals to graze on sludged land. The National Research Council recommends an 18-month waiting period between sludging and grazing. Vermont requires a 6 month wait. NH puts the cattle back in the fields 45 days after the sludge is spread.

Under the old sludge rules, UNH Cooperative Extension Service set agronomic rates -- how much sludge is spread on farmland based on nitrogen needs of the crops. UNH prided themselves on their low application rates which they said would limit buildup of toxic metals in New Hampshire soils.

But the waste industry was unhappy with UNH's low application rates. And they were successful in getting the sludge rules amended so that now they can bring in their own "experts" to set application rates. And you can be sure those rates are gong to be much higher than anything UNH recommended.

Under the old sludge rules, out-of-state sludge permits expired after 2 or 3 years. Under the new rules, out-of-state permits are now good for 5 years. Under the old rules, site permits expired after 5 years. Under the new rules, sludge site permits last for 10 years!

The NH Dept. of Environmental Services says they cannot prohibit sludge imports because of the interstate commerce clause of the constitution. The truth of the matter is all they have to do to get rid of this out of state sludge is exactly what Vermont, Maine and Massachusetts do -- require extensive extra testing of sludge which comes from industrial sources.

Not only does the DES not use testing to keep out industrial sludge -- to the contrary, when the test results show the sludge is hazardous waste -- they change the test results!!

When the DES gets a sludge sample for testing, they write on the Chain of Custody form directions to the laboratory to report the results in dry weight. When test results come back at over 100 parts per million hazardous waste level -- the DES revises the test results downward from dry weight to so-called wet weight.

The Federal Register and Code of Federal Regulations state all sludge measurements shall be in dry weight. . The EPA stated in a case before the Environmental Appeals Board -- which is the highest tribunal in the agency -- that dry weight measurements are essential to its regulatory scheme. And yet the DES and waste industry revise the sludge test results downward to so-called "wet weight" !

The waste industry comes to the legislature and tells you hundreds of NH farmers will be put out of business if they don't get this free sludge fertilizer.

According to the NH Dept. of Agriculture, there are 2900 farms in NH with more than $1000 a year in sales. In 1997 only about 31 NH farmers put sludge on their land --- and I say "about" because many of those so-called "farmers" are tenants who merely "lease" other people's land and own none of their own. Also, a great deal of sludge is being put on state land. Sewage sludge from the heavily industrialized city of Lowell, Massachusetts, was spread on the state-owned Green Gold Farms in Con cord last year. And sludge has been put on Fish & Game wildlife management areas in Dover and Lebanon.

I cannot tell you how many farms used sludge in 1998 because the waste industry won't give me that information. The point is, less than 2% of NH farmers use sludge. The other 98% wouldn't dream of putting this contaminated waste on their land. And they are surviving very nicely without this "free fertilizer".

Please ask yourselves why NH is the only state in New England -- indeed possibly the whole country -- that allows the waste industry to put 500 to 1000 tons an acre of a combination of sewage and paper mill sludge in gravel pits? The answer is simple. Other states know gravel pits are sieves, and they don't want pollutants in their aquifers and ground water. Also remember, the waste companies are paid anywhere form $40 a ton on up to get rid of sludge --- so huge profits are being made by dumping large quantities of sludge into gravel pits

You should be aware that no Class B sewage sludge is landspread in the states of Rhode Island, Connecticut and Massachusetts. And not one tablespoon of sludge from the heavily industrialized cities of Lowell and Springfield is spread on agricultural land in Massachusetts . It is all shipped to New Hampshire.

The waste industry is running the show here in New Hampshire -- both on sludge and also as you know --on the importation of trash from out of state -- over 850,000 tons last year. Neither the EPA 503 sludge rules nor the state sludge rules are sufficiently protective of human health and the environment. I respectfully urge the Committee to approve this comprehensive sludge bill to provide New Hampshire with an extra margin of safety from this industrial sludge to protect our land, water and wildlife.

Thank you for giving me the opportunity to speak.

Helane Shields, Box 1133, Alton, NH 03809 phone/fax 875-3842

# Mom's lawsuit says sludge killed her son

By David Clancy

BRENTWOOD, N.H. — Joanne Marshall of Greenland, N.H., has filed a lawsuit in State Superior Court alleging the BioGro division of Wheelabrator Technologies Inc. caused the death of her son, Shayne Conner.

In the lawsuit, which seeks an unspecified amount, Marshall said Wheelabrator deposited sewage sludge in a field near her home. She alleges the sludge was hazardous and said her son walked through the field several weeks before he died in November 1995.

The state medical examiner was unable to determine a cause of death at the time. Acting Chief Medical Examiner James Kaplan ruled out the sludge as the cause of death of Conner, then 26.

"There was no scientific conclusion to say that the sludge caused Shayne's death, and while his death is a tragedy, the medical examiner ruled that we did not cause it," said Pamela Gratton, BioGro technical services director.

"We've been doing land applications for more than 20 years, and no claims have been substantiated. We have no reason to believe that this one is either," she said.

But David L. Lewis is not so sure. The medical examiner's work was inconclusive, said Lewis, a U.S. Environmental Protection Agency microbiologist offering testimony on Marshall's behalf.

"No tests were done that would elucidate the cause of death, so there are a host of potential causes," he said.

Lewis, a critic of sludge control efforts, said he has not been to the site. "I have read reports and seen photographs relating to this case, however. Whenever you have material blowing into houses, there are a lot of possibilities," he said.

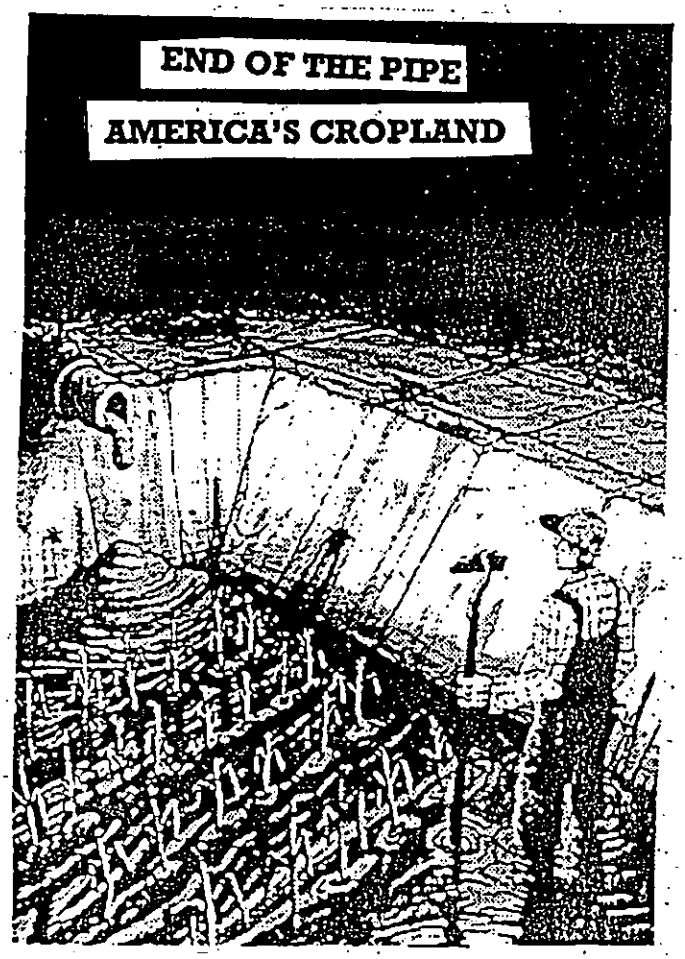
Gratton discounts the possibility of sludge blowing into Conner's house and causing his death. "If that happened, how come he was the only one affected by it?" she said. *

Marshall also has named the property owners; the Portland, Maine, Water District; and New Hampshire Department of Environmental Services Commissioner Robert Varney as defendants in the lawsuit. ■

***NOTE: Shayne Conner was not the only one affected by the sludge. Over 30 people in the neighborhood required medical treatment after the sludge was dumped.**

# SLUDGE VICTIMS

## EPA AND WASTE INDUSTRY SAY THESE PEOPLE DON'T EXIST!!




**U.S. COURT OF APPEALS,
FIFTH CIRCUIT, JUNE 3, 1997**

**IN THIS LANDMARK LAWSUIT WHICH THE SLUDGE INDUSTRY LOST, THE COURT FOUND:**

**"THE CONCLUSION THE EVIDENCE AT THE TRIAL SUGGESTS IS THAT EXPERTS HAVE YET TO REACH A CONSENSUS ON THE SAFETY OF LAND APPLICATION OF SLUDGE."**

**SLUDGE - "A viscous, semisolid mixture of bacteria and virus-laden organic matter, toxic metals, synthetic organic chemicals, and settled solids removed from domestic and industrial waste water at a sewage treatment plant."**
**Harper-Collins Dictionary of Environmental Science**

**********

**IT'S ALL ABOUT MONEY! THE SLUDGE MERCHANTS ARE PAID ANYWHERE FROM $40 A TON ON UP BY THE SEWAGE TREATMENT PLANTS AND PAPER MILLS TO DISPOSE OF THIS CONTAMINATED WASTE. LAND-SPREADING IS THE CHEAPEST WAY TO GET RID OF IT.**

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**The New Hampshire Dept. of Environmental Services and the waste industry say we must landspread sewage sludge to preserve "precious" landfill space.**

**IF LANDFILL SPACE IN NEW HAMPSHIRE IS SO "PRECIOUS" -- WHY DID WE IMPORT 850,000 TONS OF TRASH LAST YEAR FROM NEIGHBORING STATES WHICH WAS DISPOSED OF IN NEW HAMPSHIRE'S "PRECIOUS" LANDFILL SPACE ??**

**THE LANDSPREADING OF SEWAGE SLUDGE AND INDUSTRIAL PAPER MILL SLUDGE IS POISONING OUR ENVIRONMENT IN ORDER TO SAVE LANDFILL SPACE FOR OUT-OF-STATE TRASH !!**

**In 1997 New Hampshire generated 27,394 tons of Class B sewage sludge and industrial paper mill sludge. The landfill space used up in 1998 for out-of-state trash would have taken care of New Hampshire sludge for 31 years !**

**CORNELL WASTE MANAGEMENT INSTITUTE - WORKING PAPER**
**"The Case For Caution" August 1997; revised February 1999**
**by Ellen Z. Harrison, Murray B. McBride and David R. Bouldin**

**Nonprotective aspects of EPA 503 Risk Assessments and Sludge Rules:**

* **Pollutants allowed to reach maximum "acceptable levels" 10 to 20 times higher than acceptable levels in Canada and Europe.**

* **No evaluation of multiple pathways of risks, exposure or synergy.**

* **Underestimates of cancer risks, soil ingestion by children, cadmium and arsenic risks, and pollutant intake through food.**

* **Many pollutants not regulated or monitored; insufficient data on pollutants; no assessment of synthetic organic chemicals or radioactivity.**

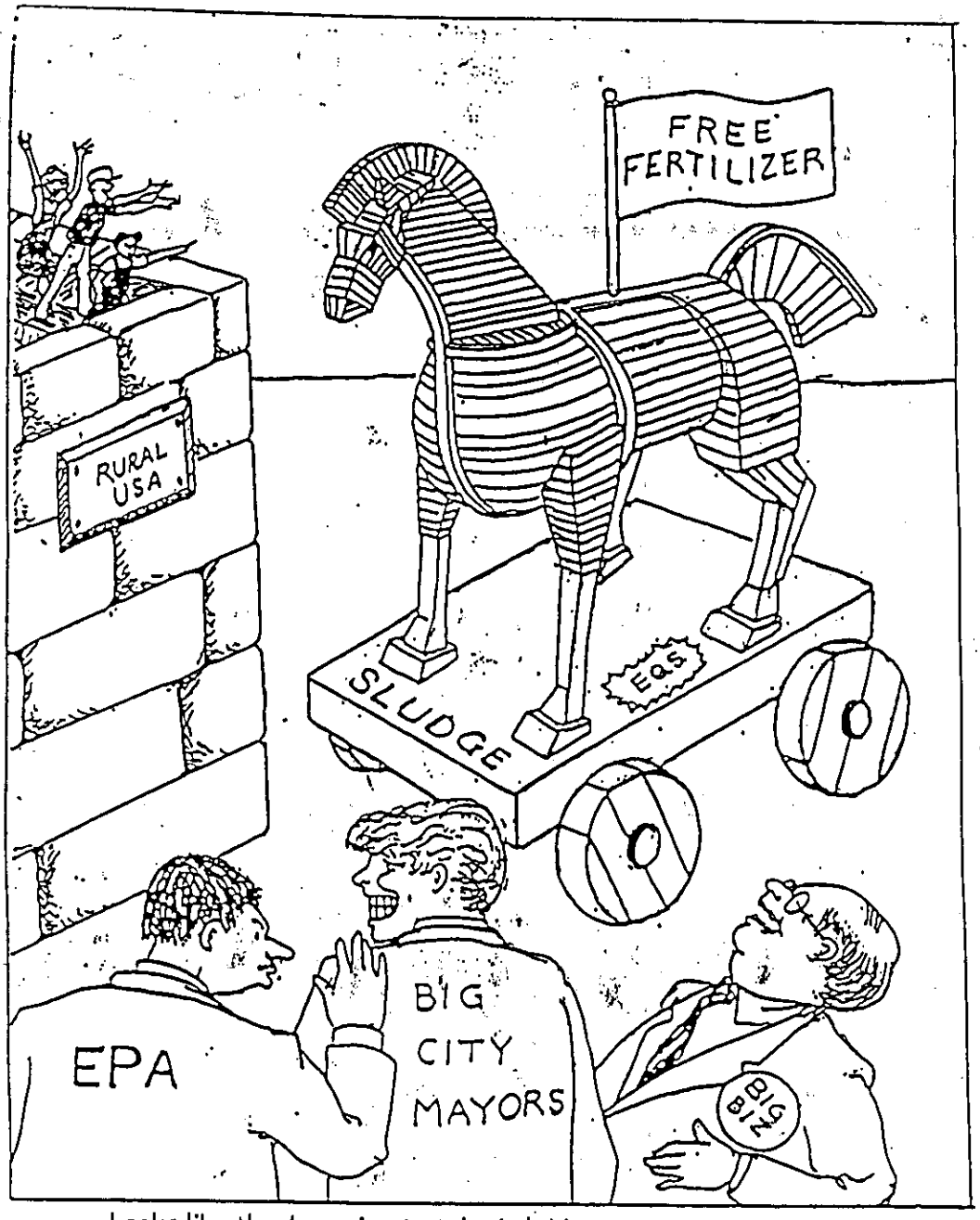
* **Defective assumptions on ground and surface water impacts from landspreading sewage sludge. Field studies disprove EPA assumptions.**

* **Inadequate assessment of harm to agricultural productivity, soil microorganisms, plant phytotoxicity, and crop yield reduction.**

* **Inadequate assessment of pathogen risks and ecological impacts**

**(This document is available in its entirety on the Internet at: http://www.cfe.cornell.edu/wmi/PDFS/LandApp.pdf )**

**Not only do the EPA 503 sludge rules NOT protect human health and the environment -- in fact they THREATEN human health and the environment!**




Looks like they're going to take it ! Now remember, not a word about all those heavy metals, toxic chemicals, disease germs, and parasites that are still in the stuff.

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**The EPA's 503 sludge regulations are not based on "good science". They are founded in bad politics and political expediency.**

**After Congress banned ocean dumping because it created vast underwater dead seas, the only CHEAP sludge disposal alternative was landspreading.**

**The EPA funded only "BENEFICIAL USE" studies to back up its so-called "Risk Assessments" to ensure industries and urban areas would be able to dispose of their pathogenic and toxic wastes "on the cheap" !**

**The true foundation of the EPA 503 Sludge Rules is a political decision to transfer toxic sewage sludge and hazardous industrial wastes from the cities and industries to the land of Rural America !**

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# Blowing the Whistle on EPA's Misuse of Science

*an interview with Dr. David L. Lewis* (706) 355-8000

David L. Lewis has a Ph.D. in microbial ecology and works for the U.S. Environmental Protection Agency. He also serves on the Graduate Faculty of the University of Georgia. His university research in the early 1990s into the potential transmission of the AIDS virus by dental drills was published in leading British and American medical journals. After carrying out a highly publicized effort to educate the public, new infection control guidelines were adopted by public health officials in the U.S., Western Europe, and elsewhere.

Considered one of the EPA's top researchers, Dr. Lewis has worked for the agency's National Exposure Research Laboratory in Athens, Georgia for over 25 years. He recently became an outspoken critic of the way his agency handles science. In this exclusive interview with *Environment News* managing editor Bonner Cohen, Lewis offers a revealing look at the complicated life of a federal government whistleblower.

Cohen: *Can you cite specific examples where regulatory decisions have been driven by poor science?*

Lewis: Just to give one example my laboratory was directly involved in, I'd say the 503 Sludge Rule passed in 1993. Essentially, this rule shifted the disposal of municipal wastes, mostly human sewage, from ocean dumping to land disposal. Now half of the total volume of municipal wastes generated in the U.S. is dumped on our farmlands.

EPA scientists had a lot of concerns about turning America's farmlands into waste sites contaminated with toxic metals and human pathogens. The science used to support the regulation was so bad it was officially referred to within EPA as "sludge magic." But administrators and senior managers in Washington completely overruled the agency's scientists. I'll never forget reading an e-mail note one EPA scientist sent to Washington after seeing that the administration included language in the final rule stating it would protect the environment. It read: "I thought we all agreed that we don't know if this rule will protect the environment!"

To me it's pretty scary when a handful of non-elected government officials at EPA can decide to protect whales from potential risks and put America's food supply and the national economy clearly at risk—turning a deaf ear to protests from their own expert scientists.

As unbelievable as it sounds, EPA set no limits to prevent the accumulation of toxic metals and other hazardous wastes from reaching levels at which the land is no longer safe for agricultural use. Europe, by contrast, has much stricter standards when it comes to land application of municipal wastes.

Cohen: *This sounds like a major problem brewing, and the public isn't even aware of it.*

Lewis: Potentially, the impact could be enormous. Can you imagine what will happen the first time an outbreak of virulent *E. coli* from one of our agricultural products gets tracked to the application of municipal wastes on our farmland? Just like international bans on accepting beef possibly infected with mad cow disease, imports of a wide range of American agricultural products will be banned worldwide. How's EPA going to explain why it didn't want whales exposed to any level of toxic metals and human pathogens in municipal wastes and decided instead to put it in direct contact with our food supply?

# WHY IS SEWAGE SLUDGE TOXIC? BECAUSE IT CONTAINS A GREAT DEAL OF HAZARDOUS WASTES!

U.S. Environmental Protection Agency
Toxics Release Inventory User Support (TRI-US)
Office of Pollution Prevention and Toxics (OPPT)
Information Management Division (7407)
401 M Street, S.W. [Room ET.711]
Washington, D.C. 20460
(202) 260-1531
FAX (202) 401-2347
Internet Address: trius@epamail.epa.gov

February 9, 1998

Helane Shields
Alton, NH 03809

Dear Ms. Shields,

This letter is in response to your FOIA request(#HQ-RIN-01260-98) dated January 24, 1998. The most recent information available for the Toxics Release Inventory (TRI) is for the reporting year 1995. The amount of TRI chemicals transferred by facilities to Publicly Owned Treatment Works (POTWs) is 59,387,743 lbs. The total amount of TRI chemicals released to surface waters is 90,243,306 lbs. If you have access to the Internet, visit the TRI homepage (www.epa.gov/opptintr/tri) for current information about TRI.

If you have any further questions concerning TRI, please do not hesitate to call the TRI-US hotline for assistance at (202) 260-1531.

Sincerely,

Lisa Flemming
Technical Information Specialist

**********

**The chemical wastes included in the Toxics Release Inventory are what is dumped into public sewers AFTER "industrial pretreatment" and are only the tip of the iceberg.**

**Only major "SIUs" (SIGNIFICANT INDUSTRIAL USERS) have to report on a very limited list of chemicals they dump into treatment plants -- nowhere near all the thousands of different pollutants discharged to POTWs.**

**The TRI does not apply to any industry with under 10 workers; it doesn't apply to processing of under 25,000 pounds annually of a specific chemical; and it doesn't apply to use of under 10,000 pounds a year of any particular chemical.**

**AND UNDER 40CFR403, EVERY BUSINESS AND INDUSTRY IN THE UNITED STATES IS ENTITLED TO DUMP 33 POUNDS OF HAZARDOUS WASTES EACH MONTH INTO PUBLIC SEWERS WITH NO REPORTING REQUIREMENTS!**

**This toxic industrial waste ends up being concentrated in the sewage sludge disposed of on the land in Rural America.**

United States Environmental Protection Agency
Office of Wastewater Enforcement and Compliance

PRETREATMENT BULLETIN
Bulletin #11
September 1992
Printed on Recycled Paper

HIGHLIGHTS

EPA SIGNIFICANT INDUSTRIAL USER SIGNIFICANT NONCOMPLIANCE STUDY
PRETREATMENT AWARDS
NATIONAL PRETREATMENT COORDINATORS MEETING
CONGRESS STILL CONSIDERING CHANGES TO PRETREATMENT LAWS
EFFLUENT GUIDELINES LITIGATION SECTION 304 (m)
519 REPORT FOLLOW-UP
EPA'S UPCOMING SLUDGE REGULATIONS
1990 TOXICS RELEASE INVENTORY DATA
CALL FOR POLLUTION PREVENTION CASE STUDIES
ENFORCEMENT NEWS
POLLUTION PREVENTION ACTIVITIES IN REGION V
TRAINING/WORKSHOPS
MISCELLANEOUS

On June 16, 1992, EPA released a report on a study of Significant Industrial Noncompliance.

EPA undertook this study to independently determine, with known statistical c the level of significant noncompliance by significant industrial users (SIUs) of Pub Treatment Works (POTWs). The study evaluated noncompliance at 640 industrial facili discharging into 60 POTWs across the country.

The central purpose of the study was to establish baseline data using a defin significant noncompliance (SNC) which the Agency adopted in July of 1990 (55 FR 3012 The study results will be used to measure future trends in industrial compliance.

The most significant result described in this report is that 54% of the 30,000 industrial users nationwide (16,200) would have been in significant noncompliance with pretreatment limits or reporting requirements, or both, using the new Federal definition the study's specific findings, 35 percent of industries nationwide had significant violations of applicable pretreatment limits; and 36 percent experienced significant violations of requirements.

Significant noncompliance was the focus of this study because it is an area o implementation for which the EPA has little verifiable data. There are, of course, programmatic measures of POTW implementation, including: percent of permits issued, of inspections or sampling events performed, number of enforcement actions taken, in or pass through of the treatment plant and improvements in sludge quality. All of t must be examined in concert to determine the overall health of the Pretreatment Prog

The study looked at industrial performance from October 1989 to December 1990 percentages indicate the number of industries which would have been identified as be for the 1990 calendar year. The study does not attempt to identify whether or when returned to compliance during the year, either voluntarily or through enforcement ac

In addition to a continued emphasis on effective enforcement, EPA will expand outreach activities, including training and guidance, to ensure that industrial fac POTWs are aware of all applicable Federal requirements. Moreover, the Agency plans increase its level of scrutiny over POTW activities and review EPA's existing oversi to ensure that appropriate emphasis is placed on industrial compliance in the future

Finally, EPA intends to conduct a broader study of industrial compliance next This EPA study may also be repeated from time to time to ensure that our conventiona

**********

**EPA AND WASTE INDUSTRY CLAIM INDUSTRIAL PRETREATMENT KEEPS TOXIC WASTE OUT OF SLUDGE. THIS EPA REPORT SAYS 54% OF INDUSTRIES DON'T COMPLY WITH PRETREATMENT LIMITS OR REPORTING REQUIREMENTS !!**

NEW HAMPSHIRE is the **only** state in New England **importing** pathogenic Class B Sewage Sludge and industrial paper mill sludge for landspreading.

**NO CLASS B SEWAGE SLUDGE WHATSOEVER IS BEING LANDSPREAD IN THE STATES OF RHODE ISLAND, MASSACHUSETTS AND CONNECTICUT !**

NOT ONE TOWN IN Massachusetts allows sewage sludge from the heavily industrialized cities of Lowell and Springfield, Mass. to be spread on their agricultural land. **New Hampshire imports sludge from both cities!**

VERMONT limits land application of paper mill sludge to **5 dry tons per acre (15 - 20** wet tons). NH Dept. of Environmental Services permits spreading of **550 tons of paper mill sludge per acre.**

**NH DES is the only state "regulatory" agency in New England promoting the landspreading of a combination of sewage sludge and industrial paper mill sludge in gravel pits over aquifers and sand and gravel recharge areas at the rate of 500 to 1000 tons per acre in violation of EPA 503 sludge rules which say agronomic rates for nitrogen may be exceeded ONLY "...WHERE THERE IS NO POTENTIAL FOR NITRATE TO LEACH DOWN TO THE GROUND WATER OR WHERE THE GROUND WATER IS NOT CAPABLE OF BEING USED AS A POTABLE WATER SUPPLY."**

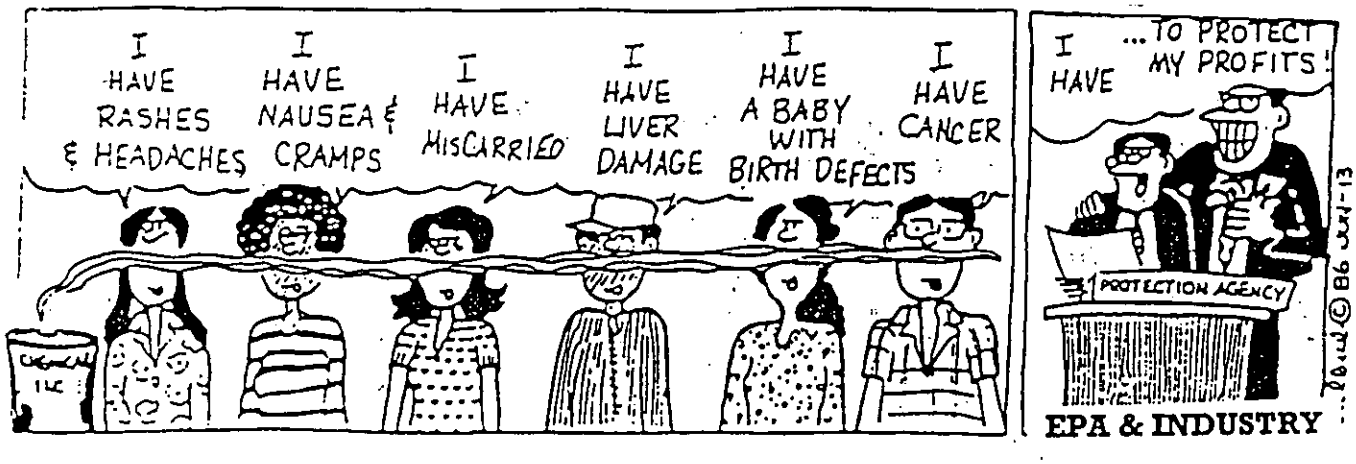
**'THE BLUE RIBBON SLUDGE PROGRAM'** was submitted to the NH DES and "Josiah Bartlett Institute for Public Policy" in September 1998. The author, **Paul Adams** of Chichester, NH is a retired engineer who worked for the State Pollution Prevention Program.

**THIS REPORT REVEALS:**

**(1) Every business and industry in New Hampshire (indeed, the whole country) is allowed to dump 33 pounds (15 kilograms) of hazardous wastes into public sewers every month without any reporting requirements. (40CFR403)**

**(2) Only 225 companies in New Hampshire -- out of approximately 4000 facilities identified by the State of New Hampshire as handling hazardous wastes -- participate in pretreatment programs controlling how much toxic substances they pour into public sewers. How many of these 4000 facilities discharge hazardous wastes into public sewers? The NH DES has not yet answered that question for us !**

**THE WASTEWATER TREATMENT PROCESS CONCENTRATES ALL THE TOXIC METALS AND MUCH OF THE TOXIC ORGANIC POLLUTANTS IN THE SEWAGE SLUDGE WHICH IS THEN SPREAD ON CROPLAND IN RURAL AMERICA AS "FERTILIZER".**



# DAIRY FARMS FILE LAWSUITS AGAINST COUNTY

## Suits allege government's past dumping of sludge endangered crops, killed farmers' livestock.

By Robert Pavey
*Staff Writer*

Two dairy farming families in Burke and Richmond counties filed separate lawsuits Monday against Augusta-Richmond County, blaming crop damage and cattle mortality on toxic metals from municipal sewage sludge.

For more than a decade, sludge from the city's Messerly Wastewater Plant on New Savannah Road has been broadcast onto agricultural fields as a fertilizer supplement, according to the U.S. District Court lawsuits.

But unknown to the farmers -- R.A. McElmurray & Sons of Hephzibah and Boyceland Dairy of Keysville -- the sludge contained a lethal mix of toxic metals and other compounds.

The contaminated lands were used for production of grazing fodder, which in turn was fed to dairy cattle.

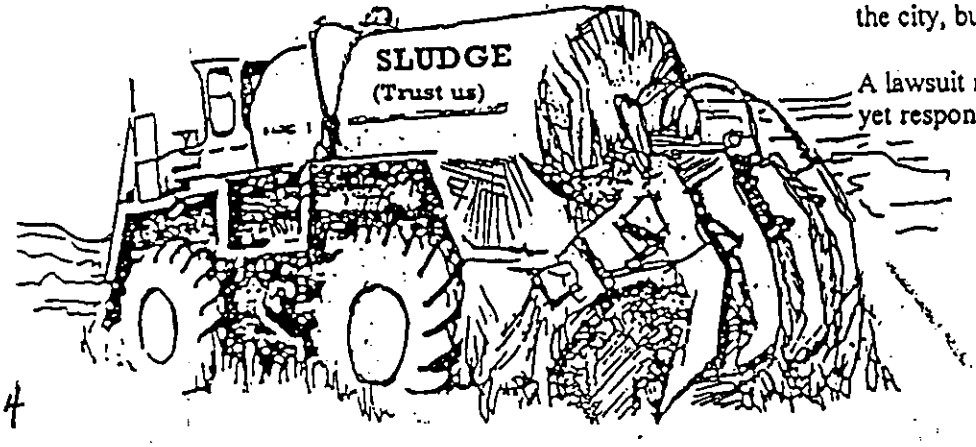
"As a result, a herd that had been healthy for 50 years has catastrophically deteriorated," the suit stated.

The surface application program was touted as a way to improve crops by using sewage as fertilizer. It also helped avoid costly expansions to the problem-plagued Messerly Wastewater Plant, which has logged a host of environmental violations in the past decade.

Both farms noticed a decline in the health of their herds a few years after the sludge applications began, but their concerns were met with reassurances by city officials that there was no connection.

The city "always responded to plaintiffs' concerns by repeatedly assuring that application of lime would prevent or eliminate any problems," the lawsuit said.

The McElmurrays became suspicious of the sludge program and withdrew in 1990, after which applications to the Boyce family's land increased. In 1991, 6 million gallons were dumped at the Boyce farm.




"When you put all the pieces together, they created a toxic soup that's killing all the cows," said the farmers' attorney, Ed Hallman Atlanta. "The experts agree with us, and there's no other explanation."

Although surface sludge programs are widely used across the nati the farmers contend the city's operation of the sewage plant was "irresponsible and slipshod," and allowed a host of illegal and forbidden materials to enter the treatment system.

Mr. Hallman said the Messerly Plant gate has routinely been left open and unsupervised, allowing septic tank trucks and others to dump anything at will. "There is absolutely no control," he said.

Cattle mortality at the Boyce family dairy averaged 3.1 percent annually before the beginning of the sludge applications. Today t mortality rate is 30 percent.

City officials had information available to them as early as 1976 about the potential risks of applying sludge to dairy farms in particular, but continued the practice anyway, the lawsuit claims.

One of the primary compounds causing problems is molybdenum metal compound traceable to industrial wastes. According to documents attached to the lawsuit, extreme levels of the materia were found both on land treated with sewage sludge, and in corn silage grown on those fields.

Other contaminants included disease causing bacteria, helminth worms, PCBs, arsenic, cyanide and assorted chemical compoun according to the lawsuit.

"The animals' kidneys and livers that filter contaminants ended with all these metals, in excess amounts," Mr. Hallman said. "McElmurray Farms picked up on it first, then others found out had the same problem."

Mr. Hallman said the milk produced by the contaminated cattle safe; the animals' systems can filter out the contaminants so non ends up in the milk, although the animals themselves eventually

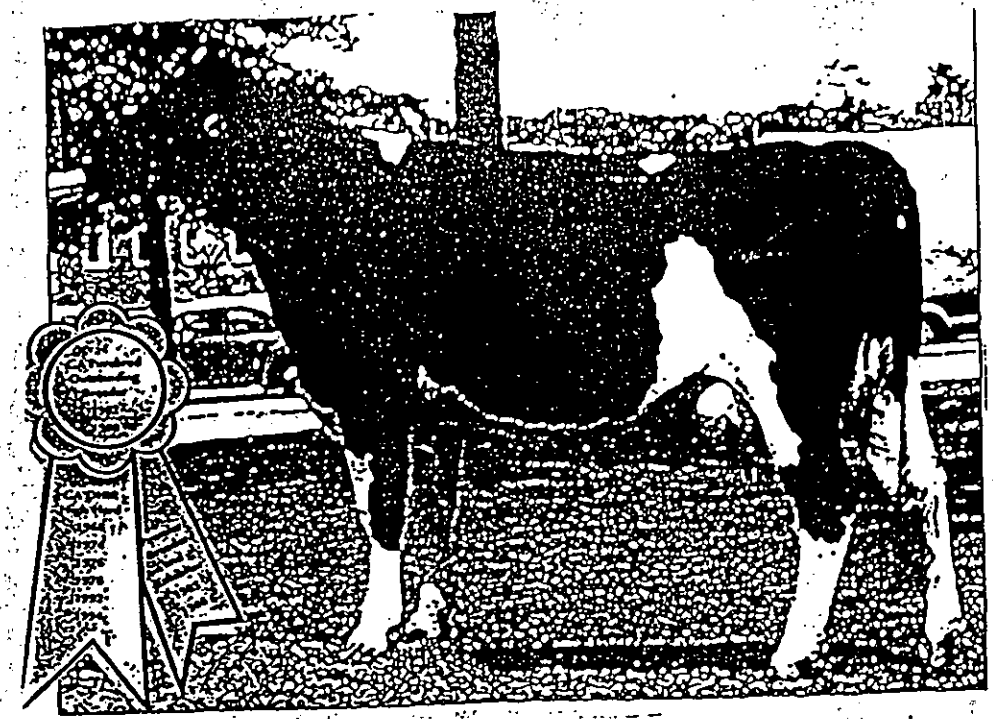
The plaintiffs are seeking unspecified damages, a court order requiring the sewage plant to abide by state and federal environmental laws; a halt to further sludge application progra and the removal of the contaminated sludge from their propert

The McElmurrays also named as a defendant their former atto A. Rowland Dye, whom they had hired to pursue litigation ag the city, but who never filed the claim.

A lawsuit represents one side of a dispute. The defendants ha yet responded.

Augusta Chronicle (Georgia)
November 10, 1998

# DEATH OF A FARM



*Dixie*
*Grand Champion at the Augusta Exchange Club Fair for six years and winner of the All Georgia 3-year old Award. Elementary school children touring Boyceland Dairy always wanted to pet and milk Dixie.*

BOYCELAND DAIRY
BURKE COUNTY, GEORGIA

**FROM THIS**



Andy McElmurray (left) and Bill Boyce talk about sick cows at their farms while at Mr. Boyce's Boyceland Dairy. The two farmers are suing the city of Augusta for contaminating their land with sewage sludge that they contend is laced with a lethal brew of toxic metals and other compounds.

**TO THIS**

**FROM THE USE OF SEWAGE SLUDGE "FERTILIZER"**



Typical of what is currently happening to approximately 30% of the Boyceland herd.

The Boyceland Dairy has now uncovered information which shows that the City intentionally led the dairy management to the erroneous belief that the sludging of the farm lands was safe and beneficial. In truth, the City poisoned the land and the animals that depend upon that land with its slipshod and irresponsible management of inherently dangerous sewage sludge.

# Experts prepared to testify against city

*Web posted*

By Robert Pavey
*Staff Writer*

A host of paid experts are prepared to testify about links between Augusta's sewage sludge and sick cattle on two dairy farms, according to reports filed Monday in U.S. District Court.

Boyceland Dairies and R.A. McElmurray & Sons are suing the city over claims their land and cattle were poisoned by sewage sludge that was treated and applied improperly.

The sludge, a byproduct of sewage treatment at the city's Messerly Wastewater Plant, was touted as a free fertilizer to enhance hay, corn and oats grown for cattle feed.

The families, however, claim the estimated 93 million gallons of sludge applied to their lands over two decades contained industrial chemicals that slowly poisoned their cattle.

City officials deny those claims, and are appealing a Dec. 28 Georgia Environmental Protection Division order mandating widespread improvements to the city's sludge program and other wastewater operations.

The families filed statements in court this week from 19 potential expert witnesses -- most of whom would be paid for their opinions -- including engineers, veterinarians, toxicologists, soil scientists and agriculture specialists.

Dr. Richard L. Large, president of A&L Analytical Laboratories, wrote that soil from the farms contained seven to 10 times the average levels of the metal molybdenum, but that normal levels were found on land where sludge was never applied.

Dr. H.G. Blaylock, an Augusta veterinarian, wrote "there is no doubt in my mind" that the families' herd deterioration is the result of sludge poisoning.

Molybdenum, he wrote, is passed from cattle through excrement and not retained in their bodies. However, the molybdenum causes retention of copper in cows' livers and kidneys in forms that are not usable to the body.

The result, Dr. Blaylock wrote, is a copper buildup in those organs, but an actual copper deficiency in the cows. Clinical signs of copper deficiency, he added, were major symptoms in cows that died.

Another vet, Dr. Chip Pritchard, wrote that the primary symptom on both farms was an unexplained degeneration. "The single most striking feature (other than death) is the wasting away of the body condition," he wrote.

The city has not yet responded to the statements or filed reports that could counter those offered by the plaintiffs.

Robert Pavey covers environmental issues for *The Augusta Chronicle*. He can be reached at (706) 868-1222, Ext. 119, or rpavey@augustachronicle.com.

**EXPERTS HAVE NO DOUBT HERD DETERIORATION WAS CAUSED BY SLUDGE POISONING.**

# SLUDGE VICTIMS - THE ZANDER FAMILY, LYNDEN, WASHINGTON

For 28 years Ray and Linda Zander lived in their picturesque yellow two story home, situated on a manicured lawn, surrounded by fruit trees, sugar maples and rhododendrons, raising their family and operating a successful dairy.

In 1988 sewage sludge was spread on neighboring 70-acre site which was leased by a waste disposal company. Within a year, the Zander's noticed a change in their herd. Milk production dropped from 19892 pounds in 1988 to 16575 pounds in 1990. The cows were not breeding back as quickly; some developed arthritis in their hind legs; calves were born with tendon abnormalities.

In 1990, the Zanders contested the re-permitting of the sludge site. The Hearing Examiner sided with the Zanders, saying "Bone development problems and increased calf mortality ...is consistent with exposure to detected levels of copper and zinc in the (Zander's) well."

When authorities investigated the sludge site, they found it was a converted wetland that was clearly unacceptable for sludge spreading. The low soil pH resulting in acidic conditions (which increases metals mobility), drainage pattern, and chemical content of the sludge enabled heavy metals to enter groundwater and move from the sludge site into the Zander's land and water

Blood and tissue samples taken from the sick cows showed extensive liver damage.. Tests of the Zander well water showed levels of lead, copper and zinc far exceeding Federal Safe Drinking Water Act maximum contamination levels. Lead was 40 times above the federal guideline of 25 parts per billion.

The Zanders suffered numerous health problems. Linda experienced mycoplasma pneumonia, chemical induced brain damage, thyroid problems and immune system damage. Raymond suffers from hyperthyroid, lupus and nickel toxicity.

Others who lived in the area and on the Zander farm also suffered serious illness. Mrs. Zander's daughter-in-law almost died because it took her doctor over a year to properly diagnose the fecal parasite BLASTOCYSTIS HOMINIS which was eating away her life blood. The source of this infectious disease is human waste. Mrs. Zander's 10 year old niece, who lived on the farm, was also infected with this intestinal parasite - she suffered severe stomach cramps and liver problems.

Their four dogs died; an autopsy revealed chemically induced hepatitis. A native Co-Ho salmon stream that bordered their property was destroyed by the sludge pollutants.

Weakened by their declining health, and insurmountable financial woes because of the high mortality of their dairy herd, the Zanders were forced abandon their beloved farm and file for bankruptcy.

The story of the Zander's sludge nightmare appeared in "Farm Journal, March, 1992". Dr. Susan Cook, (360)647-7926 investigated.

In June 1998 their attorney filed suit in the Washington Appeals Court to overturn a lower court ruling that the Zanders are barred from recovering their losses by the "public duty doctrine". That court apparently found that the "public duty doctrine" frees municipalities from responsibility for polluting wells, ruining crops, poisoning livestock and contaminating farms with toxic sewage sludge. The Zanders have been denied their day in court.

Ray and Linda Zander are slowly trying to regain their health and rebuild their life. Linda has formed a support group "Help for Sewage Victims".

Linda Zander, 803 East Main St., Everson, Wash. 98247., (360)966-8829



"WE WANT TO SERVE AS A WARNING to other farmers not to allow this stuff [sludge] on their land," say Lynden, Wash., dairy farmers Linda and Raymond Zander. "You don't get something for nothing. There is a cost, and the cost could be your farm."

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THE MIAMI HERALD

# SLUDGING IT OUT: PAPAYA GROWER SETTLES SUIT FOR $3.9 MILLION

11th Circuit Court of Appeals rules that sludge killed papaya crop. Court decision says "...living organisms remained in sludge producing toxic gases which destroyed the plants' root systems".

Saturday, June 1, 1996

Section: FRONT

Page: 1A

SOURCE/CREDIT LINE: JOSEPH TANFANI Herald Staff Writer

Bill Parker's dream of a papaya empire wilted mysteriously under a hot Bahamian sun.

Now, 10 years after he bought 13 boatloads of Dade sewage sludge, his dead plants are good for a $3.9 million check.
Who's paying? You are. At least, if your toilet is plugged in to a Dade sewer. The county settled a lawsuit last week.

Parker says bacteria in "Daorganite," half-baked remains of Dade sewage, cost him his whole farm.

"I was ruined by that stuff," Parker says. "I lost everything."

Parker grew up in Miami, son of a lawyer and a papaya lover. "I have a lifelong love affair with papayas," he said.

In 1986, he came up with his own little version of heaven: a 500-acre papaya plantation in Freeport, Grand Bahama,
bankrolled by a wealthy British knight, Sir Jack Hayward, and a U.S. government program.

Two test crops came up beautifully. Best papayas in the world, Parker said. He figured to make $400,000 a year, minimum. "I realized I had a gold mine."

Parker grew his prize fruit in 18-inch trenches filled with sludge: "Milorganite" from Milwaukee, a product he'd used for 30 years. The people at Dade's soil conservation district said they had a deal he couldn't refuse: the very same soil-enriching stuff, for $35 a ton instead of $180 a ton.

Fertilizer not what he expected

Wonderful, Parker thought. But when the first boatload came in from Virginia

Key, Parker smelled a problem. He was used to a dry, cakey Milwaukee sludge, and this stuff was not dry. His farmworkers would have none of it.

"Just a slimy, wet, gooey material," Parker said. "They knew what it was. There was no kidding anyone." Parker grabbed a bucket and led the charge: "I stripped down to my shorts and shoes and got down in the bottom of that damn stuff."

At first, the plants came up fine. Then, panic: all at once, the bottom leaves turned yellow.

"We don't know what the hell it is," Parker says the scientists told him. "Not insects, not disease."

Too late, a University of Florida researcher figured it out: clawing away the muck, he found all the roots burned. Everything died, the whole crop. Financing dried up. Sir Hayward ended up with the farm, and Parker went to court.

The culprit, Parker now believes, was sludge bacteria. Milwaukee kills that fecal coliform and streptococcus by heating it to 750 degrees.

Dade sludge not hot enough

But Dade allows 90 percent of its sludge to dry in the sun, stirred once in a while by a machine called a "Brown Bear." The hot Miami sun kills some bacteria, but not all.

"They knew that product they were selling to me was not processed," Parker says. "Everybody knew about it but me."

In 1992, Parker's suit against Dade went on trial before U.S. District Judge Lenore Nesbitt, with a cast of dueling microbiologists and sludge people. Lawyer Francis Sexton handled Parker's case; Ervin Gonzalez is his lawyer now. Roger Welcher represented Dade's insurance company.

To George Fitzpatrick, a University of Florida professor who testified at the trial, sludge is "like wine -- 'Paul Masson will sell no wine before its time.' If you don't process sludge enough so it's stable, you can't use it to safely grow agricultural products."

Lots of maybes

Dade representatives still don't think their sludge killed the papayas. Maybe Parker used too much, they said, though Parker says he did what the experts told him. Maybe the weather was too dry, then too rainy. Maybe Parker's plants got an early version of a blight that later wiped out Bahama papayas.

Environmental regulators also have their doubts about Parker's claims. The

case of the dead papayas is notorious in the national sludge fraternity.

"I've been doing this for 12 years," said Alan Rubin, senior scientist with the biosolids team of the U.S. Environmental Protection Agency. "Nobody has presented to me any documented evidence that bacteria has directly caused crop death, or even stunted crop growth. I've never seen any evidence that happened."

Rubin says it sounds as though Parker may have burned his plants by botching the sludge application.

But the jury believed Parker.

"He's a very likable guy. And it is a very boring topic," theorizes Richard Hoffman, an appellate lawyer for the county. "You had a bunch of scientists going on about various theories of micro-organisms. The only person who was truly animated and genuinely moving was Parker, and this was his life."

Although an appellate court threw out the $6.7 million award, it upheld the finding of fault. Over a barrel, Dade struck a deal with Parker. Insurance companies are picking up about $900,000 and the sewer department will pay the rest.

Water rates will not increase

Dade will handle the payout without another bump in its water and sewer rates. It has been putting money aside to pay Parker, says director Anthony Clemente.

From Clemente's view, it could have been a lot worse: A jury thought Parker deserved $6.7 million.

Dade, meanwhile, still ships thousands of tons of the very same sludge. It is now called "Florida Organics," and it fertilizes the plants that wind up on your windowsill and the oranges that end up in your morning juice. Other cities across America also sell their sludge.

Dade scientists and lawyers say there's nothing to worry about. They say nobody else ever had a problem -- except for the smell.

"People will say, 'Boy, I wish that stuff didn't smell that way,' " says Doug Ulmer, a South Dade natural resources conservationist with the U.S. Department of Agriculture. "But if it's a good fertilizer, it's a good fertilizer."

Parker, now 68, says he'll only end up with about $375,000, once the lawyers and creditors are paid. He says it's small compensation for eight years of his life spent fighting the lawsuit.

He plans to take his money and head back to those same Bahama fields.

"I'm going to be growing papayas," he said.

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## OTHER FLORIDA SLUDGE INCIDENTS:

The concluding part in an examination of the sludge industry.

By Christine Hawes
and Tom Spalding
STAFF WRITERS

When nine of his mares developed infections last year and couldn't get pregnant, David Spicer didn't know what was to blame.

Sludge never crossed his mind.

But after ruling out impotent stallions, poor feed and bad luck, the Manatee County horse breeder's suspicions turned to his horses' watering pond, a few hundred yards from where sludge had been applied.

"They dumped over there constantly," Spicer said, referring to the land next to his own.

"This is all supposed to be a safe product that they are putting out there. You figure if the county allowed them to do it, the state allowed them to do it and the health department allowed them to do it, you figure it's all right."

There's no proof that sludge – what's left after raw sewage is processed at a sewage treatment plant – caused Spicer's mares to become infected. The landowner denies Spicer's claims.

There is no indisputable evidence that sludge has damaged anyone's health, animals or plants.

Spicer and other landowners across the country, however, are coping with unexplainable health problems and contaminated soil or water that didn't appear until after sludge was spread on their land or neighboring land.



MICHAEL WILSON/THE LEDGER, LAKELAND

Maria Sizemore, a Polk County resident who blames sludge for the health problems she's suffered since moving onto her ranchette in March 1991.

**Polk County resident Maria Sizemore blames sludge for nosebleeds, tumor growths, rashes and other health problems she's suffered since moving onto her ranchette in March 1991.**

**Sizemore discovered that sludge had been applied to her land for years, including three months before she purchased it. In addition to her own health problems, several of her animals have grown tumor since she moved onto the property. One horse lost 400 pounds.**

**A test of Sizemore's private water well showed elevated levels of iron, and a soil test showed fecal coliform counts too high to read.**

**Doctors and veterinarians refuse to link the problems to sludge. Sizemore says there's no other explanation. She has spent more than two years and $50,000 haggling county officials for better regulation of sludge spreading and has hired attorneys to handle her case.**

**"Nobody would take the time or spend the money todo what I've done," she says. "But I can't give up. I just don't think this is right and I want to know what's going on."**

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## 1994 - RALEIGH, NORTH CAROLINA - MORE DEAD CATTLE ....

**Cattle died from nitrate poisoning. The high nitrate forage was grown in sludge-amended soil.**

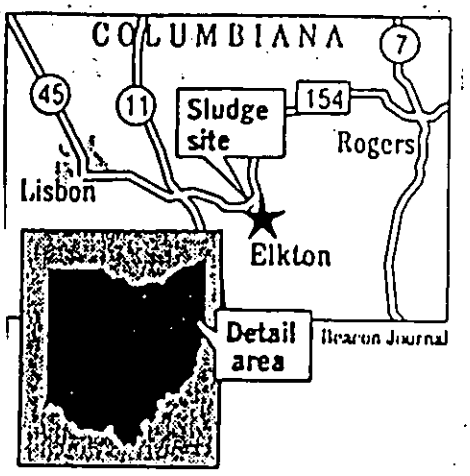
**EPA blames the farmer for his dead cattle because the farmer failed to dilute the toxic forage with low-nitrate fodder as recommended by the sewage treatment plant !!**

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AKRON BEACON JOURNAL

# FAMILIES SAY SLUDGE HAS HURT HEALTH, LIFE

# OHIOANS BLAME EPA-APPROVED RECLAMATION SITE FOR SICKNESS, SMELL, BAD WATER. COUPLES SUING COMPANY




Tuesday, September 10, 1996
Section: OHIO
Page: A1\
BY BOB DOWNING, Beacon Journal staff writer
Illustration: PHOTO: Color / MIKE CARDEW / Beacon Journal *** MAP: Shows location of sludge site / Beacon Journal

Caption: Kathy and Bob Hunt in front of their home, where tests show high levels of fecal coliform bacteria in their well water. They blame sludge-covered fields bordering their land for that, and for a terrible smell.

The plan to ship New Jersey sewage sludge to Ohio frightens Patti Baker to death.

The Columbiana County woman, her husband, and another family say they have been victimized by sewage sludge shipped from New Jersey, New York and Pennsylvania by the same company involved in the latest proposal. The sludge, they say, polluted drinking water, affected their health and resulted in an offensive stench for two years.

The two couples have filed a $9.8 million lawsuit against the companies involved in dumping that sludge on a nearby mine reclamation site from 1992 to 1994 and against neighbors who allowed sludge to be spread on their land. The suit is pending in Columbiana County Common Pleas Court in Lisbon, south of Youngstown.

In court papers, the companies deny any responsibility for the problems cited by Baker, her husband, Wilson, and neighbors Kathy and Bob Hunt.

Wheelabrator Water Technologies Inc. -- now the parent company of Bio Gro Inc., the company involved in the sludge hauling -- declined comment, citing litigation, said spokesman John Goodwin.

"It's been a nightmare," said Patti Baker, 42. "They've taken away my life. ...

This was a peaceful place in the country until sewage sludge turned our lives upside down. Nobody should ever go through what we've been through."

Her 52-year-old husband, an autoworker, has tumors on his liver. Patti Baker has two diseases her endocrinologist says are linked to the sludge.

The doctor told Patti Baker to stop drinking her well water or move. The Bakers got their well tested and were shocked to learn it was contaminated with ammonia. But they could not afford to move.

The couple and Patti Baker's 17-year-old son, Keith Dunkel, drink only bottled water. They also haul water weekly from her mother's house in Canfield outside Youngstown, a 56-mile round trip.

Dunkel was forced to stop raising animals for the 4-H Club because the family had no means to provide safe water for the animals.

Even today, the Bakers disinfect their washing machine and dishwasher, fearful of health-threatening germs in their well.

Tests showed the Hunts' well to have high levels of coliform bacteria. A Youngstown State University lab that tested the well advised the Hunts not to bathe in their water, not to allow any open cuts to come in contact with it and to boil the water before using it.

They rely on bottled water for drinking and haul water from a relative's house in Lisbon for dishes. But they say they have no choice but to shower and bathe with the polluted water.

The Bakers and the Hunts say the stench from the sludge site was overpowering.

"It just took your breath away and hurt your eyes, throat and noses," said Bob Hunt, 53. "The smell was so thick it could almost choke you to death. It was so bad that the birds left."

The main odor was an ammonia-urine smell that got worse when it rained and when it was hot and humid, they said.

"Frankly, we were prisoners, forced to stay inside our homes for two years," said Kathy Hunt, 51.

"You ran from your car to the house because the odors were so overpowering. You had to keep the doors and windows closed all the time and the air conditioner running. Friends and relatives stopped coming by because the odors got to them and would make them sick when they visited," she said.

At the height of the odors, Patti Baker would frequently drive her son,

violently ill, to her mother's house in the middle of the night. His vomiting would end as they left the Elkton area.

During a three-month stretch in early 1994, the family spent perhaps three nights in the house because of the odors, she said.

The stench was so bad the Bakers bought a wood furnace because their oil furnace brought in offending odors from outside.

Patti Baker said a five-story-high white haze of foul-smelling gases migrated from the sludge site to their property.

The sludge problems the two families cite began in 1992.

That's when the Ohio Environmental Protection Agency and the Ohio Department of Natural Resources approved the reclamation project in a one-time strip mine northeast of Elkton in Elkrun Township.

The project came about after the Ferris Coal Co. of East Palestine went bankrupt. The state ordered the reclamation.

Bio Gro started hauling sludge to the 1,300-acre site from New York City, Pittsburgh and four sewer districts in New Jersey.

Wheelabrator is the company that wants to haul as much as 50,000 tons of sludge from the Passaic Valley Sewerage Commission in Newark, N.J., to 16 counties in Ohio. That includes Summit, Stark, Wayne and Portage counties.

That project has been halted, at least temporarily. The Ohio Environmental Protection Agency has revoked its permit for the project, citing a technicality. It has ordered a second review that includes public input, which the first review did not include.

What is proposed for the Passaic Valley sludge differs from what happened in Columbiana County. Far more sludge can be applied on reclamation sites -- up to 65 tons an acre -- than on farmland, a maximum of five tons an acre.

The strip mine site was permitted to get as much as 237,000 tons of sludge. That is an amount nearly equal to the sludge all of Ohio's sewage plants produce annually.

No one agrees on how much sludge was spread. The Ohio Department of Natural Resources estimates 458 acres were reclaimed with 17,216 tons of sludge. Some of that acreage got as much as 65 tons an acre, equal to a layer 4 inches thick.

But the Bakers and Hunts contend that far more sludge went down. More than 70 trucks a day often headed for the reclamation site and nearby private farms, they say. There are places on the reclamation site where the sludge is

up to 8 feet thick, they say.

The project was terminated in 1994, amid widespread complaints about odors and water problems.

The odors remain, but nothing like it once was, Hunt said.

The streams around the site are often filled with mountains of suds from ammonia runoff, the Ohio EPA says.

The Ohio EPA is aware of some problems around the site, but it has no evidence of health-threatening problems like those suggested by the Bakers and Hunts, said agency spokesman Mark Stump.

The odor problems were more numerous than most other sites and local streams were fouled with sludge-based pollution that has had a slight impact on aquatic life, he said. The EPA cited the company for problems at that time.

The agency can step in if there is evidence of problems from the sludge site, but it has no firm evidence, Stump said.

The sludge site -- now largely overgrown with weeds -- cannot be used for additional sludge dumping without new approval from the EPA, he said.

At least one other family has sued over the sludge dumping and settled out of court with the companies. Terms of the settlement remain secret.

Now, the Bakers and Hunts are the only ones fighting the sludge.

Said Patti Baker, "Why doesn't it stay in New Jersey and out of our back yard?"

APPEALS FOR HELP TO STATE AND FEDERAL OFFICIALS GOT "NO ACTION". VICTIMS SAY US EPA MORE INTERESTED IN PROMOTING LAND APPLICATION OF SLUDGE THAN PROTECTING THE ENVIRONMENT.

# Families say sludge has hurt health, life

## Ohioans blame EPA-approved reclamation site for sickness, smell, bad water. Couples suing company

(1999-VICTIMS PAID OFF-FORCED TO SIGN "GAG ORDERS")



MIKE CAUDEW/Wheeling Journal

**Kathy and Bob Hunt in front of their home, where tests show high levels of fecal coliform bacteria in their well water. They blame sludge-covered fields bordering their land for that, and for a terrible smell.**

JAN. 2, 1999

The Citizen, Laconia, N.H.

# Govt. Fails to Regulate Sludge Dumping

WASHINGTON

**Jack Anderson**
COLUMNIST



Like many places in the late 1970s, the city of Augusta, Ga., had a problem: millions of gallons of sewage sludge and nowhere to put it. And like many cities, Augusta turned to the easiest, cheapest solution: spreading it on farmland.

Augusta city officials targeted two dairy farmers, R.A. McElmurray, Sr. and Hugh Boyce, for sludge dumping.

Like all sludge, the Augusta variety was produced by running whatever was dumped into the city's sewer through a series of settling pools and chemical treatments. The treated water is discharged, leaving a highly concentrated sludge of industrial byproducts and human waste that has creatively been labeled "biosolids."

The dairymen accepted vast quantities of "biosolids." McElmurray took more than 71 million gallons through 1990, and Boyce took 23.4 million.

Around 1986 both McElmurray's and Boyce's farm managers began noticing some disturbing things: the leaves on their feed crops were twisted and the roots weren't forming properly. Their cattle were losing weight, giving less milk and their mortality rates were slowly rising.

After carefully eliminating a range of possibilities, McElmurray attributed the farm's problems to the sludge and canceled his sludge contract in mid-1990. But city officials didn't miss a beat. They brazenly tripled the amount of sludge they dumped on Boyce's property while they scrambled to secure new dumping grounds.

By 1993 Boyce's herd and land were being ravaged. Mortality rates had quadrupled from 1980 and annual milk production had dropped significantly. Things continued to spiral downward as herd managers ruled out one possible cause after another. By early 1998 the herd's mortality rate was approaching 30 percent. Finally, Boyce canceled his sludge contract.

Soil samples from McElmurray's and Boyce's farm support what the dairymen had already concluded: the city's sludge was toxic, laden with high concentrations of heavy metals, volatile organics and petroleum byproducts.

Boyce and McElmurray have filed a suit against the city in federal district court. When we asked Augusta city officials to respond to the allegations, we were told "our comment is no comment."

A growing number of anti-sludge activists say stories like Boyce's and McElmurray's are evidence that the spreading of sewage sludge is nothing but a way for government officials to escape liability for a highly concentrated toxic waste.

Former chemistry professor Stanford Tackett describes sludge spreading as "a scam of enormous proportions, driven mainly by money."

The greatest danger of sludge dumping, experts say, is that no one really knows what's in it. Among the more disturbing facts uncovered by the Augusta lawsuit is that the city was allowing extensive after-hours dumping. In a Feb. 13, 1995 memo, the city's director of Water Pollution Control acknowledges that "currently haulers who dump after normal business hours are on the honor system, and we have no control over what might be introduced to our plant."

Pat Costner, who owned and operated a small wastewater analysis lab before taking her current job with Greenpeace, told our associate Ashley Baker that "very few industries know what's in their discharge. They will know fairly broad parameters, but they won't know every chemical that's in there. If a city has a pretreatment program, it will only address a fairly limited number of chemicals."

Another problem is that government agencies require relatively few companies to treat their waste before sending it down the drain. The New York City Department of Environmental Protection, reported that as of March 1994, there were 93,900 establishments of "possible concern" dumping dangerous and toxic substances down the drain. But in the end, the Department identified only 1,141 that "needed regulation."

Even regulated companies are suspect. A 1993 EPA report found that 54 percent of the 30,000 industrial users nationwide were in "significant non-compliance with pretreatment limits or reporting requirements, or both."

*Former chemistry professor Stanford Tackett describes sludge spreading as "a scam of enormous proportions, driven mainly by money."*

But rather than cracking down on such practices, the EPA has orchestrated and funded a massive public relations program to "educate the public" about the "beneficial uses" of sludge.

We were surprised to learn that the EPA's top sludge regulator, Alan Rubin, had been loaned to the Water Environment Federation, the sludge industry's lobbying and public relations arm in 1995 while EPA continued to pay half his salary.

Rubin's response to our questions about the dangers of sludge was predictable. "In all of the years I have worked on this, I've never seen a documented case (facts are gathered, report is written and peer reviewed by qualified scientist) of a human getting sick from or a animal dying from biosolids or exposure to biosolids."

Does this sort of narrow answer remind you of anything else going on in Washington right now?

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*Jack Anderson is a syndicated columnist*

# Nitrate issue goes to court

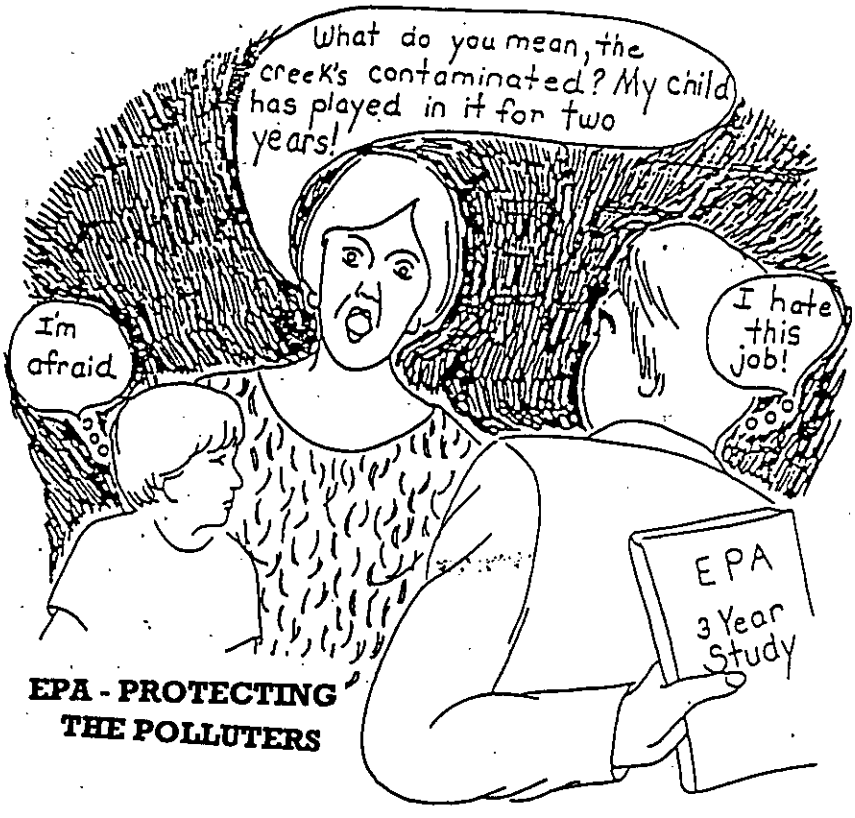
## Residents are suing the City of Albany, and a sludge disposal company for contaminating their drinking water with nitrates.

Wynell Carter and 109 of her neighbors are banking on Albany native and Atlanta attorney Tommy Malone to make their water clean again. The city has hired a group of experienced land use attorneys to defend the city. The high-powered Malone has his own team of environmental lawyers.

They will try to prove that the city acted recklessly when it allowed Sani-Angri to spread too much of the sludge onto three of their disposal sites over a 10-year period. Nitrates in the sludge and chicken litter previously on the site apparently seeped into the ground water. Nitrates pose a threat to those who drink the contaminated water and has forced some to treat or used bottle water.

The "water buffalo" portable water tank has been in the community for over a year. Everyone though it would be temporary, but residents continue to see high levels of nitrates, and the tank is their only source of clean water.

Some people are taking his chances with the water, however. They just hope it's not a decision they will pay for in the long run. The case is scheduled go to trial April 5th of next year.



ENVIRONMENTAL

# Fact Sheet

NEW HAMPSHIRE DEPARTMENT
Environmental Services
6 Hazen Drive, Concord, NH 0

NHDES Technical Bulletin WSPCD-WSEB-1996-17

## NITRATE/NITRITE IN DRINKING WATER

Excessive nitrate or nitrite in drinking water is a health concern for infants (through 6 months of age) and for women during pregnancy. The U.S. Environmental Protection Agency (EPA) has established the maximum contaminant level (MCL) for nitrate at 10 mg/L. In addition, EPA has established an MCL for nitrite at 1 mg/L.

Nitrate is a component in fertilizer, and both nitrate/nitrite are found in sewage and wastes from humans and animals. Nitrate/nitrite concentrations are not normally high in New Hampshire drinking water sources. When nitrate/nitrite are elevated, the surrounding area is often heavily developed or is used for agricultural purposes. The presence of elevated nitrite generally indicates that the activity producing the nitrite is very recent and/or very nearby.

When nitrates are elevated, an evaluation should be made relative to whether the drinking water source should be tested for pesticides or herbicides. In areas of intense agriculture, high nitrate often is used to assess the need to perform testing for pesticieds and herbicides. This testing typically costs hundreds of dollars per sample. Where either nitrate and nitrite are elevated but agriculture is not the likely source, more frequent testing for bacteria may be warranted.

### HEALTH CONCERN

Excessive levels of these nitrogen compounds in drinking water have caused serious illness and sometimes death in infants under six months of age. This condition results when nitrate is converted to nitrite in the body. Nitrite then interferes with the oxygen carrying capacity of the infants's blood. This is an acute disease in that symptoms can develop rapidly in infants. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur and responsible parties should provide infants with an alternate source of drinking water.

### TREATMENT

Nitrate/nitrite can be removed from water supplies by the following treatment processes: ion exchange, distillation, and reverse osmosis.

# State Urged to Ban Sludge

## Vt. Farmer Tells Legislators Horror Story of His Biosolids Use

By GORDON D. KING
Staff Writer

CONCORD — A Vermont farmer who says his milking cow herd and crop lands have been destroyed by the use of sludge is urging Granite State legislators to approve a moratorium on the use of the material.

"I lost my cows and have 27 acres of land which didn't grow an acre of corn," Robert Ruane of Rutland, told House Environment and Agriculture Committee members on Wednesday.

The committee is considering a moratorium on the spreading of sludge or biosolids in the state until acceptable limits on the use of the material have been set.

Ruane said sludge was spread on part of his land and his cows grazed there.

"My cows aborted or had calves which were deformed. The cows ate good but lost weight. My mind was boggled," he said.

The farmer said he lost 65 cows in his herd of 150, and the acreage produced little corn.

"There was one ear here and another 50 or 75 feet away," he said.

The dairyman said he contacted Vermont state officials and experts from Cornell about his problem, but they wouldn't tell him what was wrong with his cows and crop land. Several months later he was told he had been starving his cattle and not properly feeding them, an allegation he denied.

"You should call it (sludge) a poison for that is what it is. You can call it by any other name but it is still a poison," he said in an plea to the lawmakers to ban the material.

Ruane said he is struggling to survive as his mortgage and milk business is based on a herd of 150 cows, not 85.

"You are making a big mistake if you allow sludge to be used, regardless of what they (the experts) tell you," the farmer said, adding that he expects Vermont state officials will soon tell him he can no longer sell his milk because of the problem he is having.

Others speaking in favor of the moratorium included representatives of the Sierra Club and the Citizens for the Future of New Hampshire.

Charles Reid of the Citizens group and New Hampshire Organic Farming Association said he favored the ban and is against the importing of sludge materials into the state by firms which make a profit by spreading it as fertilizer.

"PCBs, dioxins and mercury levels are not being checked," Reid said.

He also said the amount of lead being spread by the use of sludge is unreasonable.

"The only solution is to stop importing the sludge from other states," he said.

He urged the committee to adopt rules as strict as states from which the sludge is being imported, saying that would stop the practice.

Helane Shields of Alton, a longtime opponent to the use of sludge, told the committee the use of it should be regulated by the Food & Drug Administration and not the Environmental Protection Agency as it affects the food supply.

The only person to speak against the ban was a state Department of Environmental official.

Committee members took the testimony under advisement and will issue a report within the next month.

VERMONT FARMER SAYS
SLUDGE IS POISON.

20

18

# SLUDGE VICTIMS - THE RUANE FAMILY, NORTH CLARENDON, VERMONT

Bob and Mary Ruane had successfully operated their dairy farm for many years. Their fondest hope was that their son would take over the farm when they retired.

The Ruane's nightmare began in 1986 when the City of Rutland convinced them to save on fertilizer costs by spreading sewage sludge on their 99-acre farm. The City furnished them with two tractors, a manure spreader and a set of transport harrows.

After 2 years of sludge spreading, Bob noticed a deterioration in his 150-cow herd. Milk production dropped from 18,000 pounds to 14,000 pounds. The animals weren't breeding back as quickly, they suffered a mysterious outbreak of arthritis, cows aborted or bore calves with leg deformities.

Prior to using sludge, the Ruane's had a herd mortality of 2 to 4 cows a year. After feeding his cows corn silage grown in sludge, herd mortality drastically increased. 66 cows died between January 1989 and December 1991

The state refused to renew Rutland's sludge permit because the wells on the Ruane property were contaminated with excessively high nitrate levels. Autopsies on the cows at Cornell University revealed high levels of heavy metals, which caused the animals to die from liver and kidney failure.

The Ruanes now struggle desperately to hang on, as their mortgage and milk business is based on a herd of 150 cows, not the 85 which survived. Part of the Ruane's crop land was also destroyed by the sludge --they had 27 acres of land which didn't grow an acre of corn.

The Ruane's cannot sell the farm because of the sludge contamination.. Most heartbreaking to Bob and Mary Ruane is the fact that their son no longer wants to take over what is left of the family farm because of the ruin caused by the sewage sludge.

State officials ignored the Ruane's pleas for help. "No-one would listen to us", Mary says.

In January 1998, Bob and Mary Ruane came to New Hampshire and testified before the House Environment and Agriculture Committee. Bob told the legislators his experiences from the use of sludge ... he told them "sludge is poison".

Bob and Mary Ruane, PO Box 100, Middle Road, North Clarendon, Vt. 05759 (802) 775-4424

**********

**MISSOURI** - In summer 1998 a farm owner tests her soil because she suspects contamination of her land from the adjacent Kansas City sludge drainage area.

**NO SLUDGE HAD BEEN APPLIED TO THE KANSAS CITY SLUDGE AREA FOR OVER A YEAR.**

**The woman was shocked to find her vegetable farm was contaminated with >650,000 Col/100ML fecal coliform and >800,000 Col/ML Salmonella!**

EPA and waste industry claim sludge pathogens survive only 30 to 60 days in soil. **These test results prove pathogens migrate from sludge sites to neighboring properties and can survive for over a year !!** **James Bynum, KC, (816)790-3131**

May 6, 199

Whitefield N.H.
03598

To whom it may concern,

Our eppierence with B.F.I. and spreading sludg is not a good one. The summer of 1994 for our family living next to the Bean farm was terrible.

The smell coming from the sludge was nauseatin We had more huge flys around than we've ever seen. We all had upper resperatory problems well into the next year. Our sons baby came down with whoppin cough after the spreading + spent a week in the hospital Breathing the particles that flew into the air as the wind blew may have caused everyones immune systems to be weakend.

We could not enjoy our property, no use of our deck Windows had to be closed in the worst heat of the summer months. We couldn't invite people to our ho (cookouts ect.) because the smell was overwhelming.

This was the theme for the whole year.

Even after the spredding the smell was terrible, We went to our selectmen along with Mr. Bean + B.F.I

B.F.I. Went up to the farm with Mr. Bean, who agreed to till up the soil with more lime + mulch put on the top of the ground. Even after that you still could smell the oder until we finally had a snow fall cover the ground.

Neighbors should not have to be subjected to this kind of abuse! Sincerly Terry Lufkin + Brad Lufkin

# SLUDGE VICTIMS - THE JERKINS FAMILY; LAUREL HILLS, FLORIDA

In July 1996, Teresa Hansen, a registered nurse, wrote to the Secretary of the Dept. of Environment, Florida, with a copy of the letter to Carol Browner, EPA Administrator, Washington, DC, detailing the sludge nightmare being suffered by her daughter and grandchildren from a neighboring sludge operation.

Mrs. Hansen sent a video to Al Rubin, EPA Office of Water, with copies to other officials, documenting some of the violations:

* Cattle grazing while the sludge was being spread

* Improper terracing, allowing sludge run-off into adjacent stream which empties into the "Yellow River" State Recreational area.

* Application of sludge right up to her daughter's fence line

* Violation of Florida law which requires incorporation of sludge into the soil.

Mrs. Hansen's letter told of residents in the area of sludge stockpiles dumped on clear-cut land suffering from nausea, weight loss, and depression over the fact that no-one from state or federal environmental agencies would help them. The odors seeped into their homes and clothing, forcing them to move out of their houses for days at a time to escape the stench.

The Jerkins family did not realize the sludge was toxic. The family dog was not leashed and would roll in the sludged fields. The dog lost urinary tract control and tests found the dog with extremely high levels of protein in her system, indicating the liver and kidneys were no longer able to filter the poisons from her body.

Soil samples taken by Mrs. Hansen's daughter, Darcy Jerkins, from their front drive and in front of their porch revealed total coliform/fecal coliform levels >160,000 MPN coliform/100 mL. (The maximum allowed for safe swimming in Florida is <2400/100mL.) Their property was saturated with fecal coliform from the adjacent sludge spreading operation.

The Jerkins children, ages 2 and 7 were both infected with the intestinal parasite BLASTOCYTITIS HOMINUS -- WHICH ORIGINATES FROM HUMAN FECES. The Jerkins family was forced to abandon their $500,000 home and move intro a mobile home.

Appeals to state and federal agencies for help were met with defense of the sludgespreading activities and total indifference to the suffering of the victims.

(1) EPA Reg. 4 office in Atlanta, and the EPA Wash. DC headquarters - (AL RUBIN)--both DENY ANY KNOWLEDGE OF THIS CASE EVEN THOUGH WE HAVE A COPY OF THE LETTER WRITTEN TO THEM, and even though Rubin was sent a copy of the video showing the violations.

(2) This case was resolved by the victims receiving a settlement from the sludge spreader, and the whole family was forced to sign a GAG ORDER barring them from discussing this sludge incident or sewage sludge publicly ever again.

Teresa Hansen, Rt. 1, Box 326, Laurel Hill, Florida 32567 (904)652-4795
Darcy Jerkins, 4129 Millside Rd. Laurel Hill, Florida 32567

# TILTON, NH - WELL CONTAMINATED BY SLUDGE - ON THE RECORD !

On September 4, 1997, the Tilton Board of Selectmen met with Wheelabrator regarding their plan to spread 814 tons of Class B sewage sludge from the heavily industrialized City of Lowell, Massachusetts, in a Tilton gravel pit. This was to be Phase 1 of a 5-year sludge plan.

To prevent nitrates and other sludge pollutants from leaching into groundwater, Wheelabrator said they planned to spread newspapers in the gravel pit and put the sludge on top of the newspapers.

Mike Rainey, N. H. Department of Environmental Services (NH DES) told the Tilton Selectmen there has never been a documented case of a well being contaminated by sludge.

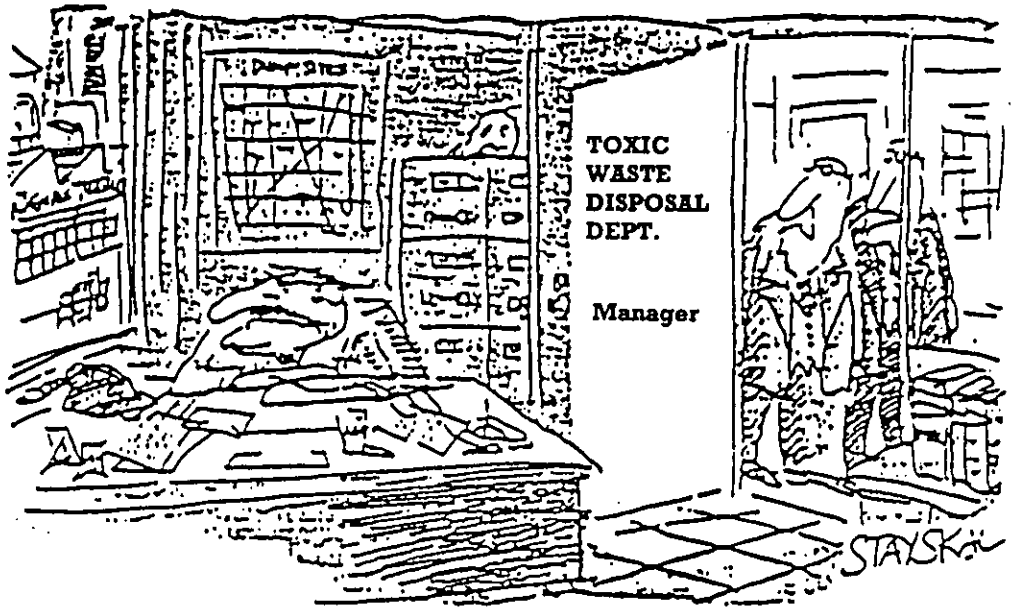
Mr. Richard Bachelder, 506 School Street, Tilton (286-4031) told the Tilton Selectmen that the well of his neighbor, Mrs. Terry Snyder, was contaminated by Lowell sludge spread 3 years ago by BFI.

Bachelder said Mrs. Snyder had her well tested before the sludge was spread. The water was fine. After the sludge spreading, the test revealed the well was contaminated by E Coli bacteria. (Testing was done in accordance with accepted protocols by State Laboratory.)

Mr. Bachelder said Charlie Hanson (at that time still employed by BFI) came out, looked around, and told Mrs. Snyder her well contamination was caused by a bird feeder.

Mr. Bachelder said Mrs. Snyder complained to the NH DES. He said the NH DES did everything they could to AVOID "documenting" Mrs. Snyder's well contamination. Bachelder said based on the way the NH DES handled this case, "...there is no way any well will be documented!"

Mr. Bachelder told Mike Rainey that the NH DES " ...did a horrible job" ... and that "...if you put an effort into investigating, there probably would be hundreds of cases (of contaminated wells)."




**"I've discovered he's insensitive, unscrupulous and devoid of moral character ... we were lucky to get him !"**

# Farmer sues DeKalb, hay supplier, claiming food killed 61 cows

## TOXIC HAY FERTILIZED WITH SLUDGE CITED IN COW DEATHS

A Stockbridge farmer said he believes 61 of his cows died as a result of eating toxic hay.

So H.J. Peterson is suing DeKalb County, which fertilized the hay with sewage sludge, and the company that sold it to him, for $150, 000, claiming "extreme mental anguish and pain," as well as the loss of his livelihood.

"It got to where I couldn't go in the barn," said Peterson, before referring a reporter's questions to his lawyer. "I'd think, 'How many dead cows am I going to find today?'|"

In a suit filed in Fulton County state court last month, Peterson alleges that 61 of his cows died, another 35 had "spontaneous abortions, " and 14 were rendered infertile after feeding on hay supplied by Operations Management International Inc. in 1993.

The hay was fertilized by sludge, a by-product of wastewater treatment, from DeKalb County's Pole Bridge Creek Wastewater Treatment plant on Browns Mill Road, according to the suit.

Sludge is often recycled into fertilizer.

OMI officials could not be reached for comment despite telephone calls to the firm's offices. DeKalb County District Attorney Jonathan Weintraub found no merit in Peterson's lawsuit.

"We don't have any part in this at all," said Weintraub, who added that "a number of things" other than the county's sludge could have killed Peterson's cows.

Peterson contends that excessive levels of "nitrate toxicity" in the hay he purchased in late 1993 resulted in the bovine deaths, miscarriages and subsequent infertility problems with his herd the following year.

Peterson's attorney, Ben Studdard, was unavailable for comment Thursday.

Before refusing to discuss the matter further outside Studdard' s presence, Peterson said that before he filed his suit he had complained to OMI and to the county about the decimation of his herd.

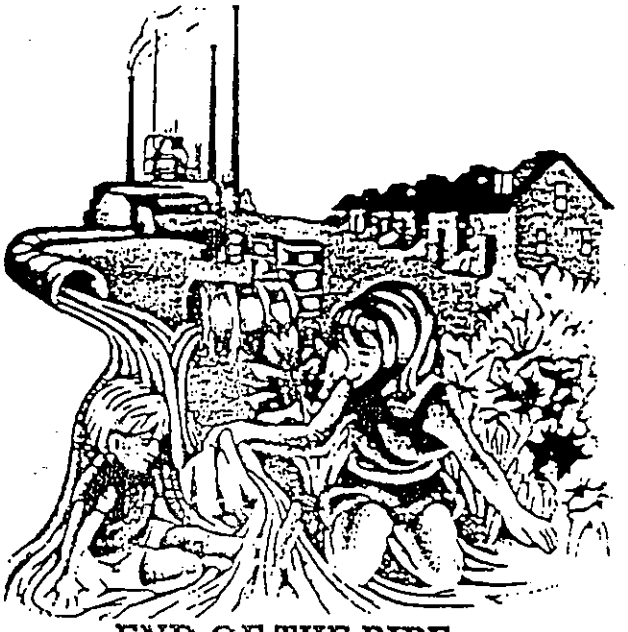
"They just laughed at me like I was a dummy," said Peterson.

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**Georgia**

**State "Environmental officials" laugh**

**at victim, offer no help.**



END OF THE PIPE
AMERICA'S CHILDREN

MODESTO BEE BREAKING NEWS
MODESTO BEE ONLINE (CALIFORNIA)
Sunday, July 7, 1996

# Atwater cited for poisoned hay

## 13 COWS POISONED BY HAY FERTILIZED WITH SEWAGE SLUDGE

By Tim Moran
Bee staff writer

The City of Atwater has been cited for applying too much sewage sludge on its farm property after hay from the farm was linked to nitrate poisoning of 13 cows on two different farms. The citation is from the California Regional Water Quality Control Board. The city contracts with a private firm, Metcalf Eddy Services, to run its waste water treatment plant and a 100-acre farm five miles south of Atwater. On the farm, sewage sludge is used as fertilizer to grow oats, alfalfa and sudan grass.

Lois Carson of Coulterville lost seven cows four months ago after feeding them sudan hay grown on the Atwater property. Manuel and Ilda Resendes of Los Banos lost six cows three weeks later after feeding them sudan hay from the property.

University of California at Davis lab tests showed the cows had died of nitrate poisoning. Tests of remaining hay showed high concentrations of nitrate.

The California Regional Water Quality Control Board's office in Fresno investigated after seeing newspaper reports of the problem. The board cited Atwater in a June 10 letter. According to the board, parts of the city farm had received up to 238 pounds more nitrogen per acre than allowed during the course of a year. The water quality board monitors sludge application because excessive application of nitrogen can cause ground water contamination.

The violations of the city's permit to dispose of the sludge occurred in 1994 and 1995. The nitrogen limits are based on the needs of individual crops, according to Darrel Evensen, a sanitary engineering associate with the Water Quality Control Board.

Arwater was to have submitted a technical report by June 25 spelling out the measures it will take to get its farm into compliance. Evensen said the report has not yet been received.

Monte Finke, who operates the waste-water plant for Metcalf Eddy Services, said the remainder of the high nitrate hay has been accounted for. "We've gotten all the hay back."

Finke said he couldn't comment about the Water Quality Board citation, but added, "We are working with the state board to get back to zero (excess nitrogen) and grow clean hay again."

In the meantime, Carson and the Resendes' have incurred losses of several thousand dollars each. The city's claims adjuster investigated and found the city was not negligent, and the city denied the claims.

"No one wants to claim responsibility, but it's not my fault," Ilda Resendes said. "We don't know what to do at this point. If it was $100 or $200 I would say forget it, but to me it's a lot of money."

Finke said attorneys for the city and Metcalf Eddy Services are working on a settlement offer, but he could not comment on details. "We are working on it. We are going to take care of it," he said.

# SLUDGE VICTIMS - BOB AND JUDY WITHINGTON, CANAAN, NEW HAMPSHIRE

In January and February 1997, shortly after feeding his herd corn silage recently purchased from an area farm, Bob and Judy Withington's dairy cows got sick and started dying. The adult cattle suffered from severe diarrhea, dehydration, weight loss, decline in milk production, problems breeding back, stillbirths and death. Some of the calves appeared to die of toxic shock.

Despite the best efforts of his veterinarian, 33 cows died. Desperate for help, Bob contacted the State Veterinarian, State Milk Inspector and Dept. of Health and Human Services. On April 10, 1997, Bob called Mike Rainey, NH DES sludge office. Bob had noticed gobs of a gray substance mixed in with the silage which was delivered to his farm. He told Rainey his cows were getting sick and dying and he thought SLUDGE might have something to do with it.

EVERYONE, INCLUDING RAINEY, BLEW HIM OFF. They refused to investigate and did nothing.

Later in the Spring, 1997, Bob got sick. He lost the feeling in his hands and arms; his legs and feet were cold and numb; the doctors were baffled and suggested it could be some kind of a neurological disease such as MS, or a brain tumor ... basically they were clueless. Bob suspects his disease is related to whatever killed his cows. The State Health agency took blood samples and fingernail clippings from Bob, and blood and hoof scrapings from the surviving cows. They said there was no evidence of heavy metals.

Bob Withington contacted me the last week of December, 1997. I checked my files and this is what I found:

(1) From September 1995 through December 1995, BFI stockpiled 353 tons of Class B sewage sludge from the heavily industrialized City of Springfield, Mass. and 256 tons of paper mill sludge on the farm where the corn silage Bob had purchased was grown.

(2) In May 1996, BFI applied to NH DES for permission to landspread this sludge which had been stockpiled on site for over 6 months.

(3) UNH Cooperative Extension Service SOIL TEST REPORT dated May 17, 1996 on this farm site indicated a pH of 7.1 and calcium saturation of 87.1%.

UNH report says selected crop: "CORN SILAGE FOR 1996"

The Report also says: "The pH already exceeds the desired range of 6.4 to 6.6. Additional lime is not recommended. Because the calcium saturation exceeds 80% DO NOT APPLY WOOD ASH OR LIME-STABILIZED BIOSOLIDS to meet lime requirement (if any)."

(4) In letter dated August 8, 1996 to NH DES, BFI said they wanted TO SPREAD THE LIME STABILIZED BIOSOLIDS from Springfield, Mass. on this site. (Which had been stockpiled there since Fall 1995).

(5) Test of the Springfield sludge on this site dated October 24, 1995 indicated a molybdenum content of 11.4 mg/kg (parts per million) and a phosphorus content of 5900 mg/kg (ppm).

CORNELL WASTE MANAGEMENT INSTITUTE, 'CASE FOR CAUTION' (regarding landspreading sewage sludge) says molybdenum availability in soils is enhanced by alkaline soil conditions and high phosphate fertilization. ..... Under such conditions, 2 to 3 mg/kg of total molybdenum in soil has produced forages WITH TOXIC CONCENTRATIONS FOR RUMINANTS.

MIKE RAINEY HAD ALL THIS INFORMATION IN HIS FILES WHEN BOB WITHINGTON CALLED HIM ON APRIL 10, 1997 AND pleaded for help. Rainey told him absolutely nothing !!. Molybdenosis in dairy cows causes severe copper deficiency. If Rainey had told Bob Withington the truth, his herd might have been saved by immediate treatment with copper sulphate!

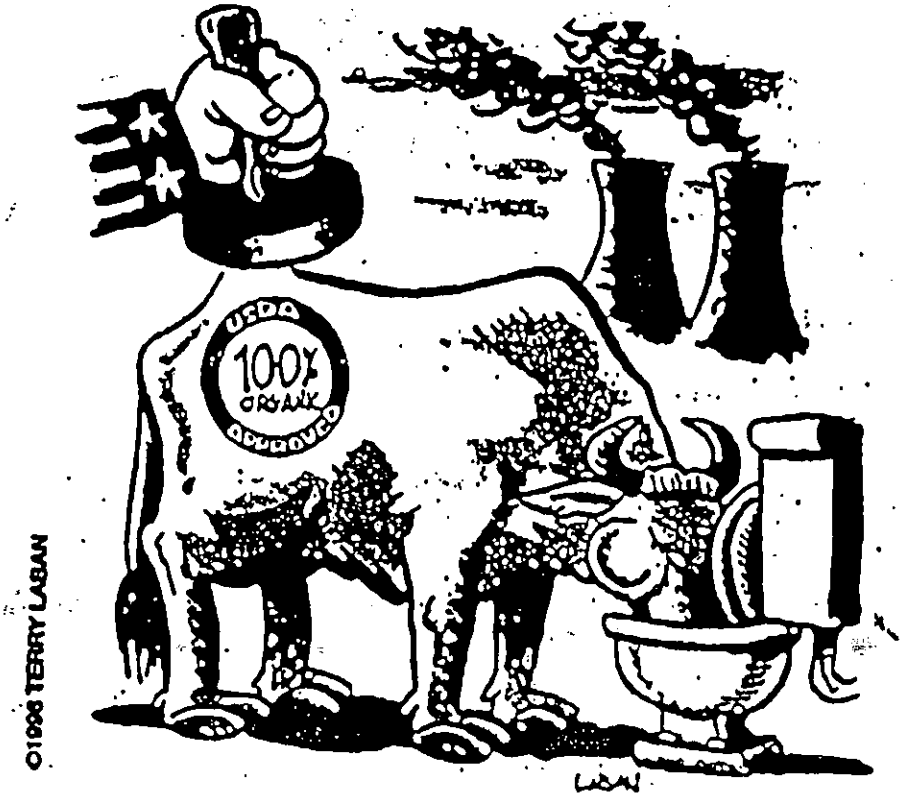
I investigated further by filing a Freedom of Information request with Region 1 EPA and learned the following: At the same time BFI was hauling Springfield sludge to NH for stockpiling, (Fall 1995) -- the molybdenum content of that sludge doubled and even tripled!! (JULY 1995, molybdenum was < 9 ppm -- AUGUST 1995, molybdenum was 21 ppm -- SEPTEMBER 1995 molybdenum was 33 ppm -- OCTOBER 1995 - MOLYBDENUM was 20 ppm.)

An analysis of some of the corn silage remaining from those fateful loads revealed MOLYBDENUM LEVELS 4 TIMES HIGHER THAN NORMAL.

It is interested to note the trucking company never billed the Withingtons for the last 2 truckloads of corn silage after they learned Bob's dairy herd was getting sick and dying. Judy asked about the bills (which total over $1400) but the trucking company kept putting them off and never asked for payment. (Guilty conscience?)

The Withington's "Homeagin Holstein" farm -- Just another dairy herd destroyed by the toxins in sewage sludge and deceitful bureaucrats who protect the waste industry at all costs!

Bob and Judy Withington, RD#2, Box 25, Canaan, NH 03741 - 603-523-7771



# Statement of Joanne Marshall

My name is Joanne Marshall and I come from a small town, Greenland, New Hampshire. Greenland is a suburb of Portsmouth, New Hampshire where the Portsmouth Naval Shipyard and the former Pease Air Force Base reside. It was once a rural community, and has a few remaining hay farms left and one dairy. The neighborhood where we live, is a quiet neighborhood, where folks gather while shoveling snow, planting their gardens or walking their dogs. I used to call it "God's little acre." A great place to raise families until it was disturbed in October of 1995, when large tractor-trailer trucks began rolling down our street, in the early morning hours before most people were stirring. These trucks were depositing truckload after truckload of some smelly, murky stuff and piling it on a field next door.

At first there was a faint smell of something in the air. Being down wind from the field, I smelt it most. In all my thirty or so years of living on this street, I never smelt anything like that. I was told the truckers were dumping, in short, a four-letter word beginning with s and ending with t. -- Sewerage, human waste. I remember thinking how inconceivable this was. On October 31st, a week later, I arrived home from work in a hurry. It was Halloween and my little girl was late trick or treating. Grabbing my bags I bolted out of the car only to be greeted by such as stench, it took my breath away. Nausea hit me like a ton of bricks and as soon as I was inside I ran for the bathroom. That frightful night became the turning point or our serene neighborhood and the beginning of nightmarish weeks and months to come.

We called the police department, who knew nothing of the dumping and then the chairman of our Selectmen, who said he also knew nothing. We then called the owner of the field, an elderly widow, who told us that her hayer persuaded her to use this stuff on her field. She said she was told that this stuff would be beneficial to the environment. She was very sorry for the smell, but assured us, as she was assured, that it was healthy and okay.

As days and weeks went by we became sicker and sicker. Not just my family, but our whole immediate neighborhood. We all shared the same symptoms; first nausea and vomiting followed by severe stomach cramps and migraine headaches. Then fever and flu like symptoms, more respiratory. There was a continual battle of thick mucous, one that made it hard to swallow and discharge. At times it appeared as if our reflex system had slowed because you would gag on the mucous and sometimes choke to dispel it. Often it would wake you because your breathing passages were blocked by it.

Upon discovering that my neighbors were experiencing the same problems, I contacted the Governor's office, which directed me to Health and Human services, Risk Assessment. The gentleman I spoke with said that our symptoms were symptoms of sludge exposure. I

asked if we could have someone come out and test this stuff, but he said he was not the one to do it. He gave us several names stemming from people of DES to the Regional EPA office in Boston. Our efforts to contact these people were fruitless. Our phone calls were not returned and if they were, we were treated rudely or given another name to contact. Between my neighbors and myself, we went full spectrum in the contacts we were given, which resulted in nothing.

Approximately three days later, the evening of Thanksgiving, I kissed my son, Shayne of 26 years, goodnight, for the last time. Around four am that morning, I was awakened to a frightful scream from my other son, who was home from college during the holiday. When I ran to the room, Shayne appeared unconscious, yet he seemed like he was gasping. 911 was called and all I could do was hug him and wait for the paramedics. We spent what seemed like an eternity in the hospital waiting room, only to be told my son was dead.

The weeks that followed were even more brutal if that were possible. We couldn't grieve for our son, because we were too busy fighting illnesses and spending sleepless nights, watching over my little girl sleeping, trying to pass the mucous in her throat and fighting viruses. Trips to the doctors and hospital emergency rooms became a frequent thing for my neighbors and us. As one who seldom ever was administered an anti-biotic in her lifetime, I went through approximately seven prescriptions of antibiotics within a year. Two of us were diagnosed with Pleurisy. Three to four or us developed abscesses and cysts that needed to be lanced. There were recurring allergenic illnesses in the young babies of the neighbors that the doctors could not pinpoint the cause. The men suffered severe nosebleeds that were unstoppable. Some of the children suffered unbearable migraine headaches. Both my neighbor and I had tumor masses surgically removed from our breasts. One neighbor suffered heart failure and one was bedridden for weeks. The list goes on and on. By the end of two years, five cats (all mousers) (two mine and three my neighbors as well as my other neighbors older dog died, all from tumors.

Again to get someone to help us proved futile. Even when noted violations to the 503's were cited, those, whose salaries are paid by us, seemed unconcerned and closed a deaf ear. Even the death of my son, was not enough to rouse them and investigate the possibility and/or eliminate the connection. Instead they fumbled at trying to find other causes to prove it wasn't the sludge. Even when the autopsy report stated the immediate cause as respiratory and the underlying cause as inconclusive; none of our officials sprang to action. All our phone calls, eventually, went unanswered and we were left to deal with the unknown ourselves. Doctor's wouldn't or couldn't help. Their reply was that they didn't know what they were dealing with. Yet they were sure to load us up with plenty of antibiotics. It didn't seem to matter that one life was lost and no one knew why. It didn't seem to matter that proven records of healthy citizens prior to the sludge dumping, were all experiencing illnesses of various kinds and medical problems. This was not a concern. Our officials and the people responsible appeared indifferent and uncaring; after all, it was only one life.

I'd like to take a few minutes to tell you about that one life lost. At a very young age Shayne learned that he could do anything he set his mind to doing with faith and God and determination. In kindergarten we learned that Shayne had a learning disability and when educators said that Shayne would never be able to read, Shayne learned to read fluently within a few month of first grade, with the help of a devoted Special Ed teacher. When they said he would never be able to function in a main stream school environment. Shayne's determination merited him all mainstream classes by his senior year in high school, with the help of another devoted teacher. Shayne was noted for giving 110% in every thing he did. When they told him that could never go to college, Shayne applied to a vocational college and was accepted and attended. Shayne loved sports and where most would have been rejected to play on school teams, Shayne won the admiration of his coaches and peers through his determination and was often awarded the most improved member of the team. In college he was given the Coaches Award for his merit, example and dedication to the team. Through his achievements, Shayne became an example and inspiration to all, particularly those like him.

However, what Shayne was particularly noted for was his love and sensitivity with people. He could pick a troubled person out in a crowd go to them, befriend them and put a smile on their face. If you needed him, no matter who you were, stranger, family or friend, he would drop everything and be there for you. Mourners came from miles around at Shayne's wake. He had touched the lives of so many people; it was hard to conceive. Even after extending visiting hours, the funeral home had to close the doors on people who were still lined up to pay their last respects. Today, people still come up to me and tell me how much they miss my son.

So, you see ladies and gentleman, one life does make a difference and one life is very important even though he may not be some famous person or celebrity. And I'm afraid we take these lives for granted, with an attitude that all life is a risk or one of indifference.

Today we spend millions of dollars, investigating crimes, tracking down criminals who perpetrate the rights of other individuals. We spend more monies providing them a fair trial and then when convicted more monies in providing them food and shelter and rehabilitation in our prisons. I am not against this. Yet, when one good citizen dies of unknown causes after a new and potentially unexplored substance had been deposited on a field next door, a preliminary autopsy is held with minimal funds, and then no more is done. There's something to be said of this. At the same time, when it comes to insure the health and safety of our citizens, money seems to take the forefront at the risk of lives. I want to quote what one representative, of the company that dumped the sludge, said when I expressed concern of the risks involved and whether there was a more ecological way of disposing this stuff. He said, "all life is a risk, lady!" And there are more ecological ways, "but they're too expensive." Yet they have given this substance to unsuspecting farmers for free. What does that say? At the expense of saving a dollar, we take the risk of expending

good lives, lives of good citizens. Citizens that make this country what it is and what it will be tomorrow. In my experience, the indifference in regard to these matters is profound.

My question is one. Are we band-aiding our problems by coming up with more medicines and methods to cure our ills? Or, are we spending the time and effort to get to the root of these problems and eliminate the source. Scientists such as those who have spoken here today, are finding that sludge dumping can affect the health of people and pollute land and water. Are we listening or ignoring the warnings of these scientists?

In closing, I will leave you with this one thought. Shayne faced many disappointments and obstacles in his lifetime, but he always found a way around them, over them or through them. Our First Lady wrote a book called "It Takes A Village" to raise a child, however, it took a huge conglomerate, greed and indifference to destroy him!

Joanne Marshall, 183 Tuttle Lane, Greenland, NH 03840 431-6983

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# BOSTON SUNDAY GLOBE, FEBRUARY 15, 1998

Joanne Marshall of Greenfield says she doesn't need a study to tell her something is wrong with sludge. Her son died on Nov. 24, 1995, a few weeks after he walked through a hayfield where some 4,000 tons of sludge from a waste treatment plant in Portland, Maine, had been spread.

The state medical examiner's office ruled the cause of his death as unknown. Then Acting Chief Medical Examiner James Kaplan immediately ruled out the possibility that the sludge played any role in 26-year-old Shayne Conner's death.

But his mother won't accept that. In the weeks before Conner's death, she says, three of her neighbors were rushed to the hospital for breathing problems; three others were treated for outbreaks of lesions on their backs, chests, and limbs.

Jonathan Balthaser, 24, developed a skin rash that he said resembled a bad sunburn, and Cathy Hamilton, a registered nurse, was bedridden with nausea and severe diarrhea.

On the day the last load of sludge was hauled in, Dave Delfino, a retired plumber, said a foul stench filled the air that burned the inside of his nose so bad it bled.

Officials of BioGro, the division of Wheelabrator Technologies that oversees the company's sludge business, say Greenfield residents blamed the sludge for their illnesses because they didn't like its odor. But there is no proof, they say, that sludge spread by BioGro caused any ailments.



GLOBE PHOTO / BARBARA HOBSON

**Tom and Joanne Marshall believe sludge dumped in their area may have contributed to the death of Joanne's son, Shayne Conner.**

# SLUDGE VICTIM - ED ROLLER, SPARTA, MISSOURI

Ed Roller had been a successful dairy farmer since 1979. In 1989, 1990 and 1991, Mr. Roller's neighbor spread sludge on an alfalfa field. Then Roller's neighbor stopped spreading sludge because they were having trouble (undefined) with their cattle.

The runoff from the neighbor's sludged alfalfa field carried onto Roller's land. In 1990, Ed had a herd of 145 cows. In the winter of 1991 his cows started dying. His Veterinarian could not find the cause. Ed sent cows for examination by the University of Missouri in Columbia. But they were unable to diagnose the problem.

Ed went to the Columbia library and found a reference to the Zander case in Washington. He called Linda who referred him to a Dr. Cook who told him how to test the foliage and the soil.

Since Ed was about to lose yet another cow, he sent it to the University of Missouri who killed it and sent organ samples to Iowa State university. The tests at Iowa State revealed the presence of the same heavy metals in the cows' organs that were contained in the sewage sludge. The scientists were particularly concerned with the phosphates and fluorides, as they effect the animals' bone structure and impact the milk the cows produce.

Ed noted that his cows would get sore feet, to the extent they couldn't move around and eventually would just lay down and die. He said one of the cows he left in the field after it died was never eaten by coyotes or vultures. He figures they are smarter than humans! After the remaining Roller cattle were removed from the area where sludge runoff from the neighbors' fields had accumulated, the animals' health improved and none have died, although some are so far gone they will probably not make it.

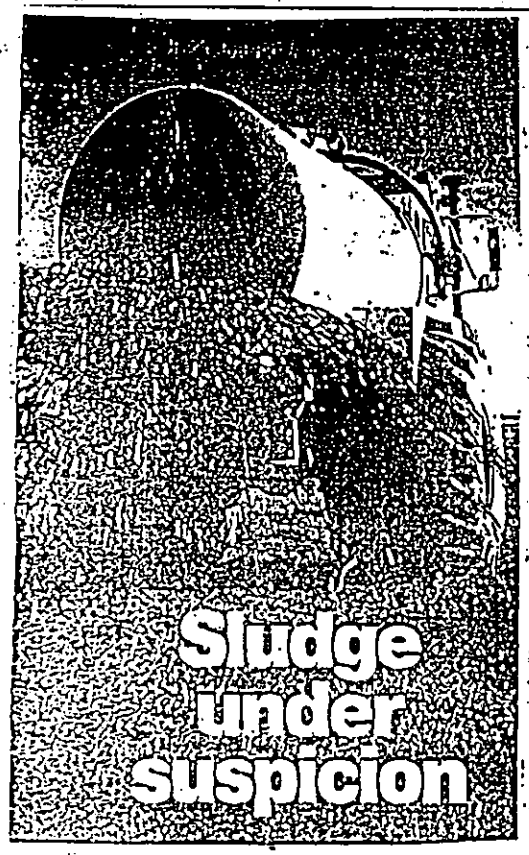
Ed Roller's personal health was adversely affected by immune system damage. Also, his father worked the farm with him -- and contaminants were found in his father's blood in 1991.

By 1994 Ed had lost 60 cows and was going broke. He filed a lawsuit against his neighbor. But all the local judges recused themselves from hearing the case. The neighbor he was suing is a prominent local resident and is on the bank board which held Ed's mortgage. When he started the sludge lawsuit, the bank started legal action against Ed Roller to foreclose his mortgage.

Ed Roller has filed for bankruptcy -- his health and his dairy farm destroyed by sewage sludge. Ed also told us about the case of a Missouri woman who let the City of Springfield spread sewage sludge on her farm -- and all the vegetation died.

Ed says appeals to the US EPA, Missouri Dept. of Natural Resources, state health department and other state agencies were met with callous indifference. **No-one investigated and "no-one seemed to care".**

Ed Roller, 5961 State Highway 14 F, Sparta, Missouri 65753 (417)634-4166
Ed's attorney: Alison Calton, PO Box 1245, Springfield, Mo. 65801 (417)869-0581




**OKLAHOMA - Ranchers claim Bermuda grass grown in sludge-amended soil caused illness in 120 miniature horses and killed 15.**

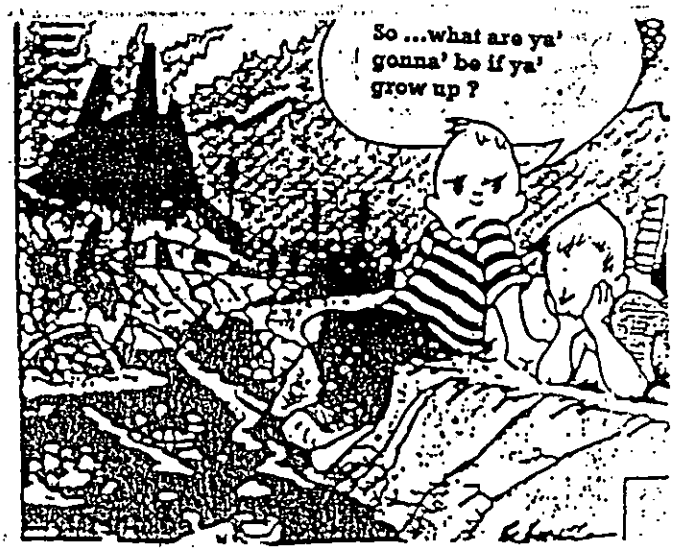
**MARYLAND SLUDGE SITE**



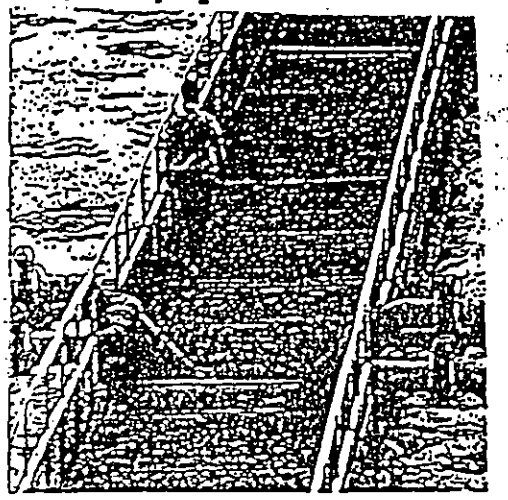
**Dr. Lee Miller: I wanted to know if it is a danger to me, my family or my animals; but I could get no answers from the people who should have them.**

**MARYLAND - Turf grass grower believes crop loss was due to use of sludge as fertilizer. EPA said use of highway roller on fields killed the grass.**

TEXAS - Keith Massey and his neighbor William Barina sought help from Senator Phil Gramm regarding their concerns about odors, potential for surface and ground water contamination, and health effects suffered by abuttors of a Class B sewage sludge site in Guy, Texas. Texas officials inspected the site and said "no glaring problems were identified". Mr. Barina now suffers from terminal pulmonary fibrosis which can be caused by "a response of the immune system of unknown cause". (Immune system damage is a common affliction of sludge victims.) One farmer exposed to the sludge 2 years ago is still suffering from throat and lung problems. Other neighbors of the sludge site are suffering from leukemia, cancer of the bladder, and lymphoma.




CHILDHOOD CANCERS ON THE RISE – LINKED TO EXPOSURE TO CHEMICALS AND TOXINS IN FOOD AND THE ENVIRONMENT.



**SEWAGE SLUDGE IS A TOXIC SOUP, KNOWN TO CONTAIN AT LEAST 25 CARCINOGENS.**

**HAWAII - Ralph Natale firmly believes daily exposure of his 12-year old son Nicky for several months to a sewage sludge stockpile at his school caused his death. Nicky's symptoms started with headaches, vomiting, sore throats and respiratory problems -- common complaints after sludge exposure. Pain developed in the right side of his neck; a lump was discovered behind his ear, and Nicky was diagnosed with Rhabdomyosarcoma, a rare malignant soft tissue muscle tumor which took his life. A lawsuit is being prepared.**

# SLUDGE RAISING A STINK

**Augusta Chronicle (Georgia)**
**November 15, 1998**

*Web posted Nov. 15 at 12:52 AM*

■ Dairy farmers suffering

By Robert Pavey
*Staff Writer*



Andy McElmurray (left) and Bill Boyce talk about sick cows at their farms while at Mr. Boyce's Boyceland Dairy. The two farmers are suing the city of Augusta for contaminating their land with sewage sludge that they contend is laced with a lethal brew of toxic metals and other compounds.
*BRANT SANDERLIN/STAFF*

Allegations that sewage sludge recycled into fertilizer can harm soil and livestock are not new. They're just new to Augusta.

"What's happening in Augusta is happening all over the country," said Charlotte Hartman, coordinator for the New York-based National Sludge Alliance, an organization that tracks sludge-related pollution issues.

Nationally, more than a dozen cases have arisen contending the same thing: that sludge contaminated with heavy metals has poisoned land, livestock, water and -- in some cases -- people.

Two lawsuits filed last week claim sludge from Augusta's Messerly Wastewater Plant that was broadcast on dairy farms included excessive amounts of toxic metals, killing cattle and poisoning the soil.

Similar complaints have arisen in Sparta, Mo., where cattle are dying on a sludge-treated dairy farm; and in Canaan, New Hampshire, where metals such as molybdenum were found in sick cattle on sludge-treated lands.

"This is a national disgrace, and it's all in the name of money," Ms. Hartman said.

For many years, sludge was dumped into the ocean. But in 1989, the practice was banned because of fish kills and water pollution.

"The options then were land application, landfills, incineration and ocean disposal," she said. "They got rid of ocean disposal, which caused a major problem for major East Coast cities, like New York."

Most municipalities chose the cheapest, easiest option: Apply the material as fertilizer.

"By calling it fertilizer, the liability transferred from the municipality to the farmer who accepts it," Ms. Hartman said.

Nationally, there is a difference of opinion about whether federal standards for land application of sewer sludge are adequate.

"There are more and more cases where people claim it's causing illness or pollution," said Patty Lovera, research associate with the Center for Health, Environment & Justice, a Virginia-based environmental group.

Today's national standards for using sewage sludge as fertilizer were developed by the U.S. Environmental Protection Agency with a lot of input from trade associations involved in wastewater treatment, she said.

"They're saying this is a safe process, but if they adopt stricter laws, that's like saying it isn't safe and never was," Ms. Lovera said.

In spite of claims by critics that the programs are risky, use of land application for sludge disposal continues to grow.

"The reason it's growing is because EPA has said it's the preferred way to deal with this material," Ms. Hartman said.

Supporters of sludge application programs say the standards are fine -- as long as the operators of the wastewater plant producing the sludge abide by the rules.

Jeff Larson of the Georgia Environmental Protection Division said each entity applying sludge to farms as fertilizer must have approved Sludge Management plans with built-in safeguards to avoid contamination.

Rules include keeping records of where sewage originates and testing material frequently for levels of contaminants, he said.

But critics like Ms. Hartman point out that the standards require testing only for eight heavy metals — ignoring hundreds of other constituents that could cause problems for farmers.

"Just think about all the things that go down the drain; runoff from streets, household chemicals, industrial toxics, pathogens, E. coli, salmonella, there are hundreds of things," she said.

She also said that following the rules is the responsibility of the wastewater plants, not regulators.

More lawsuits are inevitable over the sludge issue, she said.

Earlier this week, the Sierra Club sued the state of New Hampshire, claiming state regulators violated their own laws by using unscientific methods to determine whether sewage sludge was toxic.

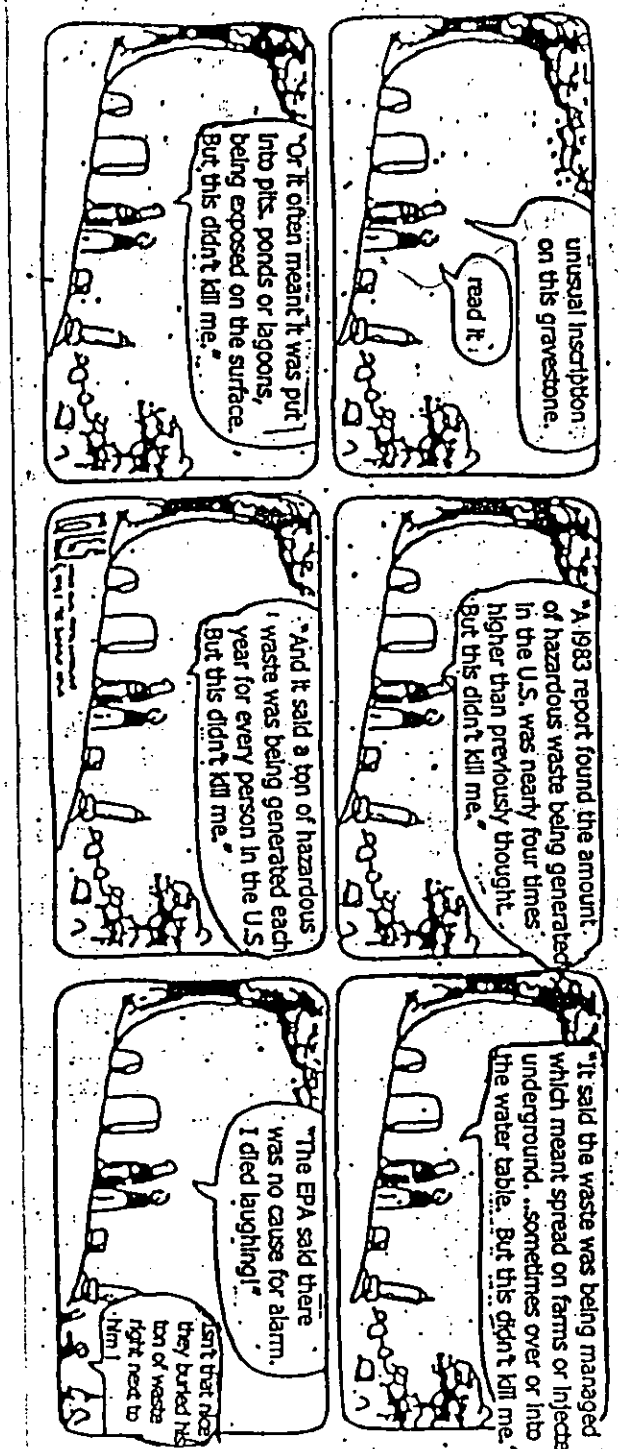
According to the lawsuit, sludge applied as fertilizer was so contaminated, state law required it to be classified as hazardous waste, which would be illegal to spread on farmland.

The complaint alleges New Hampshire state regulators lowered limits of toxic materials allowed in sewage sludge to avoid halting the practice of disposing of it in land application programs.

The state has not responded to that claim.

*Robert Pavey covers environmental issues for The Augusta Chronicle. He can be reached at 868-1222, Ext. 119, or rpavey@augustachronicle.com.*





# EPA LIST OF PATHOGENS PRESENT IN CLASS B SEWAGE SLUDGE

Table 2-1. Principal Pathogens of Concern in Municipal Wastewater and Sewage Sludge

| Organism | Disease/Symptoms |
|---|---|
| **Bacteria** | |
| *Salmonella* sp. | Salmonellosis (food poisoning), typhoid fever |
| *Shigella* sp. | Bacillary dysentery |
| *Yersinia* sp. | Acute gastroenteritis (including diarrhea, abdominal pain) |
| *Vibrio cholerae* | Cholera |
| *Campylobacter jejuni* | Gastroenteritis |
| *Escherichia coli* (pathogenic strains) | Gastroenteritis |
| **Enteric Viruses** | |
| Hepatitis A virus | Infectious hepatitis |
| Norwalk and Norwalk-like viruses | Epidemic gastroenteritis with severe diarrhea |
| Rotaviruses | Acute gastroenteritis with severe diarrhea |
| Enteroviruses | |
| Polioviruses | Poliomyelitis |
| Coxsackieviruses | Meningitis, pneumonia, hepatitis, fever, cold-like symptoms, etc. |
| Echoviruses | Meningitis, paralysis, encephalitis, fever, cold-like symptoms, diarrhea, etc. |
| Reovirus | Respiratory infections, gastroenteritis |
| Astroviruses | Epidemic gastroenteritis |
| Caliciviruses | Epidemic gastroenteritis |
| **Protozoa** | |
| *Cryptosporidium* | Gastroenteritis |
| *Entamoeba histolytica* | Acute enteritis |
| *Giardia lamblia* | Giardiasis (including diarrhea, abdominal cramps, weight loss) |
| *Balantidium coli* | Diarrhea and dysentery |
| *Toxoplasma gondii* | Toxoplasmosis |

## PARASITIC WORMS EPA SAYS ARE PRESENT IN CLASS B SEWAGE SLUDGE

| Helminth Worms | |
|---|---|
| *Ascaris lumbricoides* | Digestive and nutritional disturbance abdominal pain, vomiting, restlessne |
| *Ascaris suum* | May produce symptoms such as coughing, chest pain, and fever |
| *Trichuris trichiura* | Abdominal pain, diarrhea, anemia, weight loss |
| *Toxocara canis* | Fever, abdominal discomfort, muscle aches, neurological symptoms |
| *Taenia saginata* | Nervousness, insomnia, anorexia, abdominal pain, digestive disturbanc |
| *Taenia solium* | Nervousness, insomnia, anorexia, abdominal pain, digestive disturbanc |
| *Necator americanus* | Hookworm disease |
| *Hymenolepis nana* | Taeniasis |

Source: Kowal (1985) and EPA (1989).

## HUMANS, LIVESTOCK, WILDLIFE AND FAMILY PETS SUFFER INFESTATION FRO PARASITIC WORMS AND INTESTINAL PROTOZOA PRESENT IN CLASS B SEWAC SLUDGE.

## WHAT THE EPA SAYS ABOUT THE IMPACT OF PATHOGENS IN SEWAGE SLUDGE ON WILDLIFE:

***Environmental Effects of Pathogens in Sewage Sludg***

A major environmental concern (other than effects on p lic health) associated with land application of sewage sludg the effect of pathogens on animals. Certain human pathog can cross species lines and infect animals, particularly wa blooded animals. Little information is available on whet these pathogens pose a risk to wildlife.

(NOTE: Information on the impact on wildlife and the environment will never be available because the EPA has refused all "Freedom of Information Act" requests to release the report "Ecological Risks of Landspreading Sewage Sludge" which was completed at the Oak Ridge (Tenn.) National Laboratory in March 1997.)

# EPA RESTRICTIONS ON CROP HARVESTING BECAUSE OF PATHOGENS IN CLASS B SEWAGE SLUDGE

## Restrictions for the Harvesting of Crops and Turf, Grazing of Animals, and Public Access on Sites Where Class B Biosolids Are Applied

*Restrictions for the harvesting of crops* and turf:*

1. Food crops, feed crops, and fiber crops, whose edible parts do not touch the surface of the soil, shall not be harvested until *30 days* after biosolids application.
2. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above ground shall not be harvested until *14 months* after application of biosolids.
3. Food crops with harvested parts below the land surface where biosolids remain on the land surface for 4 months or longer prior to incorporation into the soil shall not be harvested until *20 months* after biosolids application.
4. Food crops with harvested parts below the land surface where biosolids remain on the land surface for less than 4 months prior to incorporation shall not be harvested until *38 months* after biosolids application.
5. Turf grown on land where biosolids are applied shall not be harvested until *1 year* after application of the biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the permitting authority.

*Restriction for the grazing of animals:*

1. Animals shall not be grazed on land until *30 days* after application of biosolids to the land.

*Restrictions for public contact:*

1. Access to land with a high potential for public exposure, such as a park or ballfield, is restricted for *1 year* after biosolids application. Examples of restricted access include posting with no trespassing signs, and fencing.
2. Access to land with a low potential for public exposure (e.g., private farmland) is restricted for *30 days* after biosolids application. An example of restricted access is remoteness.

* Examples of crops impacted by Class B pathogen requirements are listed in Figure 2-5.

## Examples of Crops Impacted by Site Restrictions for Class B Biosolids

| Harvested parts that: | | |
|---|---|---|
| Usually Do Not Touch the Soil/Biosolids Mixture | Usually Touch the Soil/Biosolids Mixture | Are Below the Soil/Biosolids Mixture |
| Peaches | Melons | Potatoes carrots |
| Apples | Strawberries | Yams |
| Oranges | Eggplant | Sweet Potatoes |
| Grapefruit | Squash | Rutabaga |
| Corn | Tomatoes | Peanuts |
| Wheat | Cucumbers | Onions |
| Oats | Celery | Leeks |
| Barley | Cabbage | Radishes |
| Cotton | Lettuce | Turnips |
| Soybeans | | Beets |

(This article was published by the LEXINGTON INSTITUTE and reprinted by the JOURNAL OF COMMERCE, January 27, 1999)

# Sludge Magic: EPA Spreads E. Coli

*by David L. Lewis, Ph.D.*

According to scientists working for the Environmental Protection Agency's Office of Research & Development, the Sludge Rule on land application of municipal wastes (40 CFR Part 503) promulgated in 1993 may be the most scientifically unsound action ever taken by the agency. Rather than being protective, the rule actually threatens public health and the environment.

In short, EPA's sludge rule permits land application of dried urban sewage—called "sludge"—in lieu of dumping it in the ocean, which is now prohibited. About half of the sludge from municipal waste treatment facilities across the U.S., containing human sewage, agricultural runoff and industrial wastes, is now being used to fertilize farmland, national forests, and other areas. This amount is rapidly increasing as states and waste disposal companies pressure local communities to use sewage sludge and assure the public that the EPA has determined it to be virtually risk-free.

*"Rather than being protective, the rule actually threatens public health and the environment."*

In 1972 Congress amended the Clean Water Act directing EPA to develop regulations for disposing of sewage sludge. A U.S. District Court in Eugene, Oregon followed suit in 1990, issuing a consent decree requiring the agency to promulgate the regulations within two years.

Remarkably, the agency's position on this issue reveals a sort of environmental doublespeak—traces of pesticides, heavy metals, and industrial wastes that environmental officials have long argued cause cancer and other major public health problems—are now said to be completely safe for disposal on farmlands, forests, even home lawns and gardens.

The science behind EPA's sludge rule, according to some of the agency's own scientists who reviewed it, was so bad it was popularly deemed "sludge magic" [See EPA Magic, next page]. Because sludge contains human pathogens and trace quantities of mercury, lead, and other toxic metals, applying it to areas used for growing food crops and selling bags of it to home gardeners is a source of concern. Ecologists also have reservations about the effects of nutrients, toxic metals, and other pollutants leaching from sludge into surface and groundwater.

*"Content that syringes and rubber gloves no longer litter our beaches, few policymakers and reporters seem even slightly curious about how our government solved the problem of ocean dumping of municipal wastes."*

Indeed, government researchers in Canada collaborating with scientists at the University of Quebec last year published a study showing that forests treated with sewage sludge released toxic metals in amounts that exceeded water-quality criteria for protecting aquatic organisms.

Disease-causing microorganisms that can lie dormant or proliferate in soil treated with sludge are even more disconcerting to microbiologists. Samples taken this year from land in north Kansas City contained 650,000 salmonella and E. coli bacteria per 100 grams of soil - many thousands of times higher that what is considered safe by public health officials. The source, apparently, was sludge applied in the area before 1992.

The appearance of new strains of staphylococcus, tuberculosis, E. coli and other bacteria—some of which are completely resistant to modern antibiotics—has led to a resurgence of life-threatening infections that were once easily treated. Spreading sludge, which contains such superbugs flushed down hospital sewer lines, on farms and home gardens throughout the U.S. has scientists both inside and outside of EPA understandably concerned.

With increasing numbers of children dying from E. coli strain O157 traced to an assortment of products, including strawberries and hamburger meat, citizens are becoming increasingly concerned over agricultural products imported from less developed areas of the world where human waste serves as cheap fertilizer. Content that syringes and rubber gloves no longer litter our beaches, few

policymakers and reporters seem even slightly curious about how our government solved the problem of ocean dumping of municipal wastes.

Still, it is what EPA's sludge rule says about many of the agency's other regulations that seems most enigmatic. When asked why pesticides, organic solvents, toxic metals and other pollutants in sludge pose virtually no risk to public health or the environment, agency officials point to a lack of documented cases of anyone becoming sick from exposure to sludge. Critics argue that the same can be said of traces of pesticides and other industrial chemicals in drinking water. EPA's position on sludge, they say, shows that agency regulations are often based on political expediency, not sound science.

*"It is what EPA's sludge rule says about many of the agency's other regulations that seems most enigmatic."*

**EPA MAGIC**

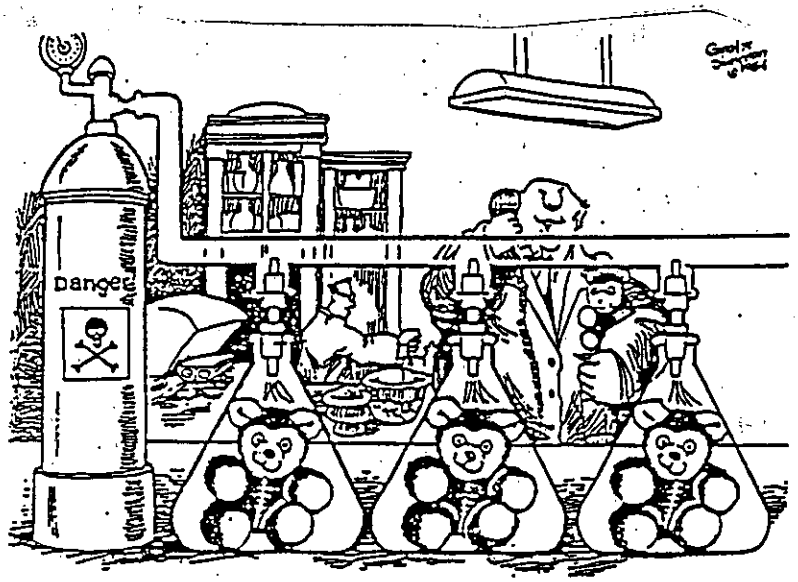
| Concerns | EPA "Magic" | Scientific Facts |
|---|---|---|
| Toxic metals, such as lead, cadmium, and mercury in sludge present a threat to public health from direct exposure and from uptake by food crops. | Metal contaminants are permanently bound to organic matter in sludge and cannot be taken up by plants or released to expose humans and animals. Only material with very low levels of toxic metals are permitted for land application. | Changes in pH, activity of soil microorganisms, and other soil processes can cause metals to be released. With no monitoring required and no limits set on maximum concentrations that can accumulate, metals will reach toxic levels after repeated applications of sludge. |
| Human pathogens in sludge can infect workers handling the material, people living in or around areas where sludge is applied, and consumers who eat crops grown on contaminated land. | Sludge is treated to reduce numbers of pathogens to safe levels. Any remaining pathogens die within 30-60 days after land application.<br>No case of disease from exposure to treated sludge has ever been documented.<br>Similar use of cow manure has not created public health problems from pathogens. | Approximately one third of the population including infants, the elderly, people with chronic diseases, patients on chemotherapy, and people with AIDS are susceptible to low levels of pathogens. Bacteria, such as *E. coli*, can remain dormant in soil for years. |
| Land application of human waste will spread antibiotic-resistant microbes throughout our environment and bring them in direct contact with the food supply. | Manure from farm animals treated with antibiotics is already widely applied to farmlands. | Specific sources of sporadic infections are rarely traced.<br>Few diseases are transmitted from cows to man. All pathogens in human waste can potentially infect other humans.<br>Human wastes, especially originating from hospitals, contain microbes resistant to antibiotics that are our last line of defense against tuberculosis and other major diseases. |

*Dr. Lewis has a Ph.D. degree in microbial ecology, works as a research microbiologist for the U.S. EPA Ecosystems Research Division, and is an adjunct scientist at the University of Georgia.*

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*DISCLAIMER: These comments represent Dr. Lewis' personal views, not official policies of the U.S. EPA.*

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**"The stuff's perfectly safe. We tested it on our animal subjects and none of them show any ill effects whatsoever!"**

# WILDLIFE CAN'T READ




## WHAT THE EPA SAYS ABOUT SLUDGE AND WILDLIFE:

"As a result the agency has determined that it is currently unable to state, with appropriate certainty, that the existing 503 rule would be broadly protective of terrestrial wildlife and native plant communities."

"Wildlife may be at risk due to direct toxicity of pollutants in sewage sludge and through indirect impacts (e.g., nutrient effects) of induced changes in plant and invertebrate communities."

"Finally, the current Part 503 ecological risk assessment did not address impacts and/or benefits at population and community levels. Therefore, uncertainty exists about the significance to population growth rates and persistence on mortality or changes in reproduction due to chemical exposure."

"Clearly, sewage sludge contains numerous organic and inorganic chemicals. Uncertainties exist however about how to extrapolate available toxicity information to birds, mammals, reptiles, amphibians, and soil invertebrates, whose relative sensitivity to the pollutants of concern (e.g., cadmium, lead, and selenium) is relatively unstudied. Bioaccumulation and food-chain bioconcentration are also poorly understood in terrestrial systems.

Scope of Work for Interagency Agreement - "Evaluation of Ecological Risks Associated With Land Application of Sewage Sludge" between Ecological Assessment Division and the Oak Ridge National Laboratory, U. S. Department of Energy AND Ecological Monitoring Research Division, Environmental Monitoring Systems Laboratory - Cincinnati - U. S. Environmental Protection Agency

---

## RISKS TO WILDLIFE - EPA COVERUP:

In March 1997 the draft report was completed at the Oak Ridge National Lab, Tenn. describing the impact on wildlife and the environment of the landspreading of sewage sludge. THE EPA HAS REFUSED ALL "Freedom of Information" requests, including intervention by NH Sen. Gregg and other Senators, to release 'THE ECOLOGICAL RISKS OF LANDSPREADING SEWAGE SLUDGE.' WHY? WHAT ARE THEY HIDING?

**EPA on ENVIRONMENTAL EFFECTS OF PATHOGENS IN SEWAGE SLUDGE:**

**"A major environmental concern (other than effects on public health) associated with land application of sewage sludge is the effect of pathogens on animals. Certain human pathogens can cross species lines and infect animals, particularly warm-blooded animals. Little information is available on whether these pathogens pose a risk to wildlife."**

**Per EPA, the parasitic worms in sewage sludge can survive in the soil up to 7 years. Sludge parasites can infect humans, wildlife, livestock and family pets.**

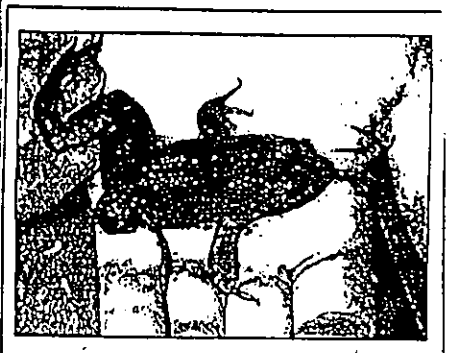


A sandhill crane picks through the freshly spread sludge on Taylor Ranch property in Manatee County. The pools of sludge on the ground can cause contamination by runoff and can be a hazard to wildlife.



**AUDUBON SOCIETY OF N.H.- 4/9/97:**

**"Sludge toxins, like other toxins such as DDT, can accumulate in the organs of animals, such as earthworms that consume the toxins. Robins and other birds, mammals, and reptiles that eat earthworms accumulate toxins, often at increasing concentrations. In the past, as with peregrine falcons and DDT, the buildup of toxins can have devastating effects: The entire population of peregrines in the eastern United States was extirpated because DDT caused eggshells to become too thin and brittle to support incubation."**



*This past summer, DES's Biomonitoring Program coordinated a frog monitoring survey and enlisted the help of 30 volunteers to assess sites across the state. This little one-legged frog was one of several deformed amphibians caught during the two weeks of frog-gathering.* *See page 5 for the complete story.*

**SEWAGE SLUDGE IS KNOWN TO CONTAIN HORMONE DISRUPTING CHEMICALS. Widespread amphibian malformities and grotesque aberrations are occurring in NH and around the country. PER NH DEPT. OF ENVIRONMENTAL SERVICES FROG SURVEY: "Preliminary endocrine results show that hormone levels in the malformed individuals were significantly lower than the levels in normal control animals."**

## NEW HAMPSHIRE TOWNS WHICH HAVE BANS, MORATORIUMS OR VERY STRICT REGULATIONS ON LANDSPREADING SEWAGE SLUDGE (AND INDUSTRIAL PAPER MILL SLUDGE IN MOST CASES):-

ACWORTH
ALTON
ALEXANDRIA
ATKINSON
AUBURN
BARNSTEAD
BENTON
BETHLEHEM
BRIDGEWATER
BROOKFIELD
DEERING
EFFINGHAM
EPPING
HANCOCK
JAFFREY
MADISON
MIDDLETON
MILFORD
NEWBURY
NOTTINGHAM
OSSIPEE
SALEM
SANDWICH
STRAFFORD
SUTTON
TAMWORTH
TILTON
WAKEFIELD
WEBSTER
WINCHESTER
WINDHAM

TOWNS WITH LOCAL SLUDGE ORDINANCES WHICH ARE MODERATELY RESTRICTIVE:-

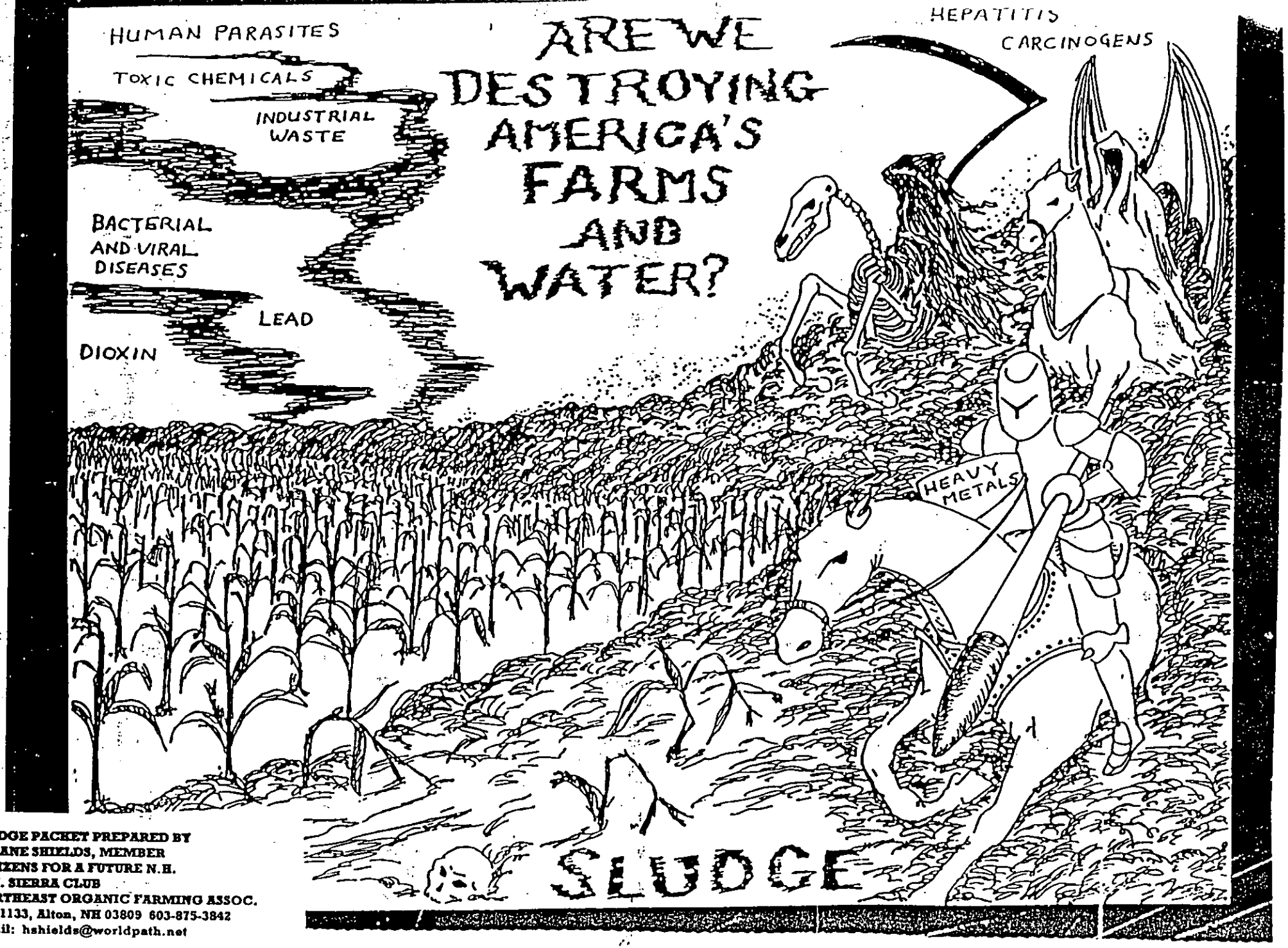
BELMONT
BRENTWOOD
CHESTER
CLAREMONT
JEFFERSON
KINGSTON
LANCASTER
LANDAFF
LITTLETON
LOUDON
NORTHFIELD
ROLLINSFORD
STRATHAM
WALPOLE
WHITEFIELD

Foster's Daily Democrat, Dover, N.H
Thursday Evening, April 3, 1997

Mike Rainey of the state's Department of Environmental Services said his organization is impartial to the voting outcome. He said the DES leaves sludge regulations up to the individual communities.

This is a "local control" issue -- as the Town of Milford, NH, found out in Spring 1998. Unanimous opposition of Town officials and residents did not deter the N.H. Dept. of Environmental Services from designating Milford as a disposal site for out-of-state sewage and paper mill sludge.

**The New Hampshire Department of Environmental Services has NEVER SAID "NO" to a sludge site permit, AND THEY HAVE NEVER SAID "NO" TO AN APPLICATION TO DUMP OUT-OF-STATE SLUDGE IN NEW HAMPSHIRE !!**




**SLUDGE PACKET PREPARED BY**
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# THE CASE FOR CAUTION

## RECOMMENDATIONS FOR LAND APPLICATION OF SEWAGE SLUDGES AND AN APPRAISAL OF THE US EPA'S PART 503 SLUDGE RULES

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**Cornell Waste Management Institute Working Paper**
**August 1997; revised February 1999**

# THE CASE FOR CAUTION

RECOMMENDATIONS FOR LAND APPLICATION OF SEWAGE SLUDGES
AND AN APPRAISAL OF THE US EPA'S PART 503 SLUDGE RULES

by Ellen Z. Harrison
Murray B. McBride and David R. Bouldin

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This document is available in its entirety on the Internet at:
**http://www.cfe.cornell.edu/wmi/PDFS/LandApp.pdf**

## Acknowledgements

The authors appreciate the comments made by many people on the drafts of this paper. Among these are Michael Bender, Josh Clelland, John Duxbury, Gerson Lesser, Kevin Mathers, Brian Richards, Sally Rowland, and Tammo Steenhuis.

Acknowledgement of their review in no way implies
their agreement with the contents of this publication.

Revised: February 1999

Printed on Recycled Paper

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## Summary

Current US federal regulations governing the land application of sewage sludges do not appear adequately protective of human health, agricultural productivity or ecological health. The risk assessment conducted by United States Environmental Protection Agency (US EPA) contains many gaps and non-conservative assumptions in establishing contaminant levels which are far less protective than those of many other nations. Current New York State (NYS) regulations are more protective than those of US EPA, but not as stringent as the recommendations of the authors. The potential for widespread use of sludge on agricultural and residential land, the persistence of many of the pollutants which may remain in soils for a very long time, and the difficulty of remediation call for a more cautious approach. In addition, reassessment of standards based on ecotoxicological impacts will need to be undertaken shortly when the US EPA-sponsored study being performed by Oak Ridge National Laboratory is completed.

Soil, water and crop characteristics in NYS and other areas of the northeastern US raise particular concerns. Shallow acid soils, abundant precipitation and crops sensitive to phytotoxic metal inputs increase the need for caution. Federal regulations are the same for all soils, areas and uses, which is an unrealistic simplification.

Based on their analyses, the authors do not suggest a prohibition of land application; but rather significantly more restrictive use. Recommendations are made for farmers and home gardeners electing to use sewage sludges and suggestions are made for policies and regulations which incorporate the more conservative assumptions expected to be more protective of human health and agricultural productivity. Limiting cumulative additions of pollutants to prevent soils from exceeding recommended maximum contaminant levels can be achieved by application of clean sludges or by application of lesser quantities of less high quality sludges. Additional testing of sludges is recommended. Caution is advised in application to pasture and forage as well as on home grounds where vegetables are grown or children have access. Further investigation is needed to assess risks to ground and surface water and to establish standards for additional contaminants.

NYS Conditions Requiring Special Consideration

- shallow soils
- acid soils
- shallow groundwater used for domestic wells
- abundant streams
- dairy as main agricultural use (sufficient N and P)
- sensitive crops grown
- large amounts of sludge relative to amount of suitable land

### Non-Protective Aspects of US EPA Part 503 Risk Assessment

The list below highlights many of the assumptions and decisions which are part of the US EPA risk assessment for Part 503 which we believe to be questionable and which are not conservative or protective. They are further discussed in the text of this paper which also contains the references on which the critique is based.

1. Pollution allowed to reach maximum "acceptable" level
2. No safety or uncertainty factors
3. Each exposure pathway evaluated separately – not accounting for multiple pathways of exposure
4. Cancer risk of 1-in-10,000 vs. 1-in-1,000,000
5. Soil ingestion rate may be too low

6. Pollutant intake through foods underestimated
   - Assessed diet very low in vegetables
   - Very low plant uptake coefficients used
   - Averages are not applicable to particular site or crop
7. RfD for Arsenic of 0.0008 mg/kg/day vs. 0.0003 or less
8. Many pollutants not regulated or monitored
   - Pollutants present in less than 10% of sludges not considered
   - Eliminated from consideration pollutants with insufficient data for full risk assessment
   - No synthetic organic chemicals regulated
   - Radioactivity not addressed
9. Ground and surface water calculations assume large dilution/attenuation
   - Leachate diluted or attenuated before reaching well
   - Only 0.24% of the model watershed receives sludge
10. Not protective of agricultural productivity
    - Phytotoxicity underestimated with potential for excessive crop yield reduction
    - Potential health impacts to grazing animals
11. Inadequate assessment of pathogen risks
12. Ecological impacts inadequately assessed
13. Inadequate enforcement and oversight
14. No labeling of sludge products

## Introduction

Sewage sludges are created for a good reason–they are the by-product of processes that clean our sewage before the cleaned water is discharged into streams and estuaries. New treatment processes hold promise for significantly reducing or eliminating sludge production (Krogmann, 1998), but until widely adopted, managing sludges is a necessity. There are currently limited options–ocean dumping has been banned–leaving landfilling, incineration, or application to the land.

The ban on ocean dumping and the environmental and economic costs of incineration and landfilling are part of what has led to increased focus on land application. Also, the philosophy of "recycle what we can" is now widely held, and it is appropriate to contemplate recycling of sludges through land application.

Sewage contains not only human fecal wastes from homes and businesses but also products and contaminants from homes, industries, businesses, storm water, landfill leachate (in some locales) and contaminants leached from pipes. The goal of sewage treatment is to clean up the water, so many

Sewage sludges contain nutrients and organic matter, but also pathogens and contaminants from home and industry.

While recycling sludges is a desirable goal, caution is warranted since many pollutants are persistent and agricultural soils are irreplaceable.

contaminants are preferentially removed from the water and are concentrated in the sludges. Thus, for example, it is estimated that about 90% of the dioxins in the incoming water (influent) will end up in the sludges. Similarly, parasite eggs settle and are concentrated in sludges. This is beneficial in providing a cleaner effluent water discharge from the treatment plant, but makes beneficial use of the sludge more difficult.

There is general agreement that the long-term goal should be to recycle the nutrients and organic matter in sludges through land application and there is agreement about the need to protect and enhance human, livestock and ecological health and the productivity of agricultural soils. While the recycling of the organic matter and nutrients contained in wastewater through land application is a worthwhile objective, the mix of chemicals and pathogens in sludges includes contaminants that are detrimental to human health, agricultural productivity and ecological health. Wastewater treatment plants have been designed to dispose of waste and not to create an agricultural soil additive. Separating the human excreta which contain the desired nutrients and organic matter from the domestic and industrial contaminants in order to create a product that is appropriate for land application is the challenge and reuse should be conditioned on meeting strict standards (Gardner, 1997). We believe that it is wise to be cautious, since many of the added contaminants are persistent and, once applied, will remain in soils and the ecosystem for many years.

In 1997, 181 sewage treatment plants which generate a little over half (51%) of the 1,000 tons per day (dry weight) of sludge produced in NYS either directly land applied or treated their sludges for use as a soil amendment. This is a significant increase from levels reported in 1994 when 36% of sludges were directed towards land application and a tremendous increase from 1989 when only 5% went to land application amendment (NYS DEC, 1998). The elimination of ocean dumping of sludges from NYC and Long Island in 1991 account for some of this trend.

## Is Land Application "Safe?"

There is debate over whether recycling of sludges through land application as allowed under current regulations is protective enough and whether it provides for a long term sustainable practice. People often ask if land application is "safe," but there is no such thing as "safe." Is it safe to drive your car? Nearly all that we do entails some risk, so the question really is "is the risk acceptable?" People's acceptance of risk is subjective and depends in part on their basic values and beliefs as well as their training and experience. For example, some people place faith in technological solutions and our ability to calculate impacts and risks. Others are more skeptical, believing that history shows that there have been numerous failures of technology resulting in unanticipated environmental and health damage. These are fairly fundamental differences in world view, leading some to favor precaution while others are willing to proceed until harm is shown to occur.

> There is no such thing as "safe." Rather, the question is: "What is an acceptable risk, and to whom?"

People's acceptance of land application also depends on their primary concerns. There is also an interesting difference in the time scales over which people think. In the calculations performed for the risk assessment regarding land application of sludges, the US EPA used a 100 year site life. This may seem a long time to Americans whose view of history is relatively short and who have been used to having huge land resources, making it easy to consider "moving on" to greener pastures if the need arises. However, our current agricultural lands in the US are substantially the same ones we will be relying on for as long as humans continue to occupy the earth.

In contrast, in Europe the view of time and land is different since one can see lands that have been farmed for thousands of years. Vineyards that grew grapes for Roman wines are still growing grapes today and lead used by Romans persists in the soil two millennia later. That makes the concept of sustainable practices that can be carried out in perpetuity much more salient in Europe.

This is not to say that people have only one interest. The neighbor and environmentalist are also taxpayers concerned about economical sludge management. The generators and vendors depend on productive agriculture for a safe and economical food supply. But differences in the primary interest of different groups help to explain why intelligent, knowledgeable, concerned people can have very different views regarding land application (Citizens' Environmental Coalition and Scenic Hudson, 1996; Cornell Waste Management Institute, 1996; Cornell Waste Management Institute, 1997; Water Environment Federation, 1996).

| | |
|---|---|
| Home gardener | Cost-effective product, risk to children |
| Grower | Reliable, cost-effective product, liability |
| Generators | Economical disposal/management |
| Neighbor | Nuisances, health, water contamination |
| Environmentalist | Ecological impacts, human health |
| Agronomist | Long-term soil productivity, plant growth |

Table 1. Different Concerns Regarding Land Application of Sludges

Thus there is disagreement about whether current regulations are stringent enough and today's sludges are clean enough to give confidence that land application is a sustainable practice or at least an acceptable risk (McBride, 1995). While US EPA asserts that application of sludges is a low risk and thus a low priority for their attention, this seems to ignore the fact that sludges may end up spread over large areas where we grow our food, obtain our water and where we live and play. The authors have particular concern for the application of the federal rules to NYS and others parts of the northeastern US where some soils have low pH which tends to increase metal availability, where a number of crops sensitive to phytotoxic metals are important and where soils are shallow, increasing concerns for groundwater contamination. In the northeast dairy is the major agricultural use, raising concerns about molybdenum toxicity to ruminants as well as concerns that the application of additional nutrients from sludges to those already provided by manure application may result in excessive nitorgen and phosphorus.

## The Regulatory Framework and Federal Standards

The US Environmental Protection Agency adopted regulations in 1993 (40 CFR Part 503, known as Part 503; US EPA, 1993; US EPA, 1994) that establish minimum standards which must be met if sludges are to be land applied. The regulations include concentration limits for 9 metals and for pathogens, and requirements for vector (flies and rodents) attraction reduction. The regulations establish Class A sludges which have been treated to essentially eliminate pathogens (disease causing organisms) and Class B in which pathogens have been reduced, but are still present. Under the federal 503 rules certain site restrictions apply to Class B use, but no individual site permits are required for its use.

The federal regulations also establish standards for 9 contaminants (Table 2). The standards include so-called "exceptional quality" (EQ) sludges which meet certain concentration limits (no more than X parts per million of any of the 9 regulated contaminants) as well as pathogen limits and vector reduction requirements. In regard to metal concentrations, sludges and sludge products which fail to meet one or more of those "EQ" pollutant concentrations but which fall below a higher ceiling concentration may be applied, but the applicator is directed to keep track of the total amount of each metal applied and cease application when a regulatory cumulative pollutant loading limit is reached. Sludge products which fail to meet one or more of the "EQ" pollutant concentrations but which fall

below the ceiling concentration may still be distributed to homes or in bags so long as information on the acceptable annual pollutant loading rate (APLR) is provided to the user. In response to a lawsuit, EPA is likely to remove this APLR provision (Rubin, 1998).

State regulations must be at least as strict as the federal standards, but states have the option of adopting regulations that are more stringent than the federal standards. New York State Department of Environmental Conservation (NYS DEC) regulations (Part 360; NYS DEC, 1993) have been more stringent in a number of ways, but NYS and many other states are considering revising or have revised their regulations, bringing them closer to the federal Part 503 rules. Land application must follow the more stringent state rules where they exist.

| Pollutant | Max. Pollutant Concentration in EQ Sludges (mg/kg = ppm) | Max. Ceiling Conc. in Sludges Applied to Land (mg/kg) | Cumulative Pollutant Loading Rate Limits (kg/ha) | Annual Pollutant Loading Rate (kg/ha/yr ) |
|---|---|---|---|---|
| Arsenic | 41 | 75 | 41 | 2 |
| Cadmium | 39 | 85 | 39 | 1.9 |
| Copper | 1500 | 4300 | 1500 | 75 |
| Lead | 300 | 840 | 300 | 15 |
| Mercury | 17 | 57 | 17 | 0.85 |
| Molybdenum | — | 75 | — | — |
| Nickel | 420 | 420 | 420 | 21 |
| Selenium | 100 | 100 | 100 | 5 |
| Zinc | 2800 | 7500 | 2800 | 140 |
| Applies to: | Bulk Sludges and Bagged Sludges | All Sludges That Are Land Applied | Bulk Non-EQ Sludges | Bagged Sludges Not Meeting "EQ" Limits |

Table 2. Pollutant Limits in US EPA Part 503 Regulations

Under the 503 rules, Class A "EQ" sludges and sludge products can be applied without restriction in amount or duration, for use in home gardens, parks, crop production, etc. No records of where and how much is used are required to be kept, nor is notification of neighbors, local officials or others required. Under the federal rules there is also no permit requirement for a site where Class B sludges or sludges not meeting "EQ" but falling below the ceiling limits are applied. Sludge products meeting Class A pathogen and vector reduction requirements but not meeting "EQ" quality standards can be distributed to the public under the APLR requirements for labeling regarding maximum annual application so long as they fall below the ceiling limits.

Currently, NYS regulations require a permit from the NYS DEC for the production and distribution of a Class A "EQ" product (such as compost or N-Viro), but no permit or records are required for the actual use. Sludge products sold in NYS but coming from out of state are not regulated by the NYS DEC. For Class B sludges applied in NYS, NYS rules require a site specific permit, record-keeping and the use of various agricultural best management practices.

A risk assessment was performed to establish the US EPA limits and to determine what contaminants to address. Since the regulations were adopted in 1993, the list of regulated contaminants has, in fact, been decreased with the elimination of chromium. While a list of 31 additional contaminants were being considered for regulation in "Round 2," US EPA is only planning to add regulation of co-planar PCBs and dioxins and furans to the list of 9 regulated contaminants in the next several years.

## Description of the US EPA Risk Assessment Process

The approach taken by US EPA to develop contaminant standards was to identify the various potential routes for exposure to sludge that is land applied and then to assess the risks posed by each of these exposure pathways. The table below lists the 14 pathways which were assessed. The risk associated with each pathway was calculated for each of the contaminants for which the assessment was performed using available data. The contaminant standard for that particular contaminant was the number generated by the pathway resulting in the lowest concentration that represented an acceptable risk according to the US EPA analysis. That pathway was called "the most limiting pathway" and for the regulated contaminants, those pathways are listed in a table below. Surprisingly to many, for 5 of the 9 regulated contaminants the pathway of a child directly ingesting sludge was deemed to be the most limiting path, generating the lowest acceptable level. Each pathway was assessed independently and no attempt was made to look at the risk from exposure through several pathways simultaneously (US EPA, 1995; US EPA, 1996c) or the effects of more than one contaminant at a time.

## Issues

The remainder of this paper discusses the issues which lead the authors to recommend a more cautious approach to land application than that of the US EPA.

The results of a risk assessment depend on the data, assumptions used, and levels of risk which are selected.

Different choices will result in very different standards.

### Risk Assessment

A risk assessment is a model which, like all models, is a simplified simulation of real world conditions that relies on many assumptions and subjective judgments. Moreover, a model is only as good as the data from which it draws conclusions. The more complex the system being modeled, the more vulnerable the model and conclusions drawn from it are to errors resulting from the gaps between the model and reality. This is one reason why risk assessments generally fail to effectively evaluate impacts on ecosystems as a whole and do not address synergistic impacts. Developing regulations for a country as diverse as the US is a tremendous challenge. The Part 503 risk assessment holds out the expectation that models approximating the reality of a ranch in west Texas are also appropriate for a vegetable farm in NYS.

Because of the limitations inherent in a model, results should include an expression of their uncertainty, whether as a range of values or through the application of a safety factor. Thus risk assessments must take both variability and uncertainty into account. Uncertainty forces decision makers to judge how probable it is that risks will be overestimated or underestimated for every member of the exposed population, whereas variability forces them to cope with the certainty that different individuals will be subjected to risks both above and below any reference point one chooses.

Calculations in the US EPA risk assessment use single values (deterministic point estimates) for input variables such as crop uptake of contaminants or food consumption. However, no single value can reflect the real variability in uptake among different crops, or at different stages in crop development or under different growing conditions (*e.g.*, soil pH, climate, management variables). Nor can any single input value represent the variability in diet among a population, i.e., people eat different quantities of different foods. While the input value used in a point estimate may be the mean (or median or geometric mean or 99th percentile) of multiple data points, as a single value it does not convey the range or likely distribution of data for the population. Nor does it reflect uncertainties due to possible measurement or random errors, nor uncertainties due to systematic biases or problems with the risk model.

Rather than using point estimates to set a risk standard (as was done by the EPA in assessing risks of land application), a more robust approach considers a range of possible input values to determine a

range of possible outcomes (a probabilistic approach). The use of point based calculations rather than a probabilistic approach can be highly misleading (Finkel, 1995). While a number of different mathematical techniques can be used, a computerized Monte Carlo simulation is a powerful means of generating a distribution of probable outcomes. The term "Monte Carlo" refers to the famous gambling resort and signifies the random selection of a winning number on the roulette wheel. The Monte Carlo method uses a random number generator to chose a set of input variables based upon the parameters. Each run or recalculation of the model generates a new scenario, and the simulation is repeated hundreds or thousands of times to generate a distribution of probable results.

| Pathway | Description of Highly Exposed Individual |
|---|---|
| 1. Sludge ⇨ Soil ⇨ Plant ⇨ Human | Human (except home gardener) lifetime ingestion of plants grown in sludge-amended soil |
| 2. Sludge ⇨ Soil ⇨ Plant ⇨ Human | Human (home gardener) lifetime ingestion of plants grown in sludge-amended soil |
| 3. Sludge ⇨ Human | Human (child) ingesting sludge |
| 4. Sludge ⇨ Soil ⇨ Plant ⇨ Animal ⇨ Human | Human lifetime ingestion of animal products (animals raised on forage grown on sludge-amended soil) |
| 5. Sludge ⇨ Soil ⇨ Animal ⇨ Human | Human lifetime ingestion of animal products (animals ingest sludge directly) |
| 6. Sludge ⇨ Soil ⇨ Plant ⇨ Animal | Animal lifetime ingestion of plants grown on sludge-amended soil |
| 7. Sludge ⇨ Soil ⇨ Animal | Animal lifetime ingestion of sludge |
| 8. Sludge ⇨ Soil ⇨ Plant | Plant toxicity due to taking up sludge pollutants when grown in sludge-amended soils |
| 9. Sludge ⇨ Soil ⇨ Organism | Soil organism ingesting sludge / soil mixture |
| 10. Sludge ⇨ Soil ⇨ Predator | Predator of soil organisms that have been exposed to sludge-amended soils |
| 11. Sludge ⇨ Soil ⇨ Airborne Dust ⇨ Human | Adult human lifetime inhalation of particles (dust) (e.g., tractor driver tilling a field) |
| 12. Sludge ⇨ Soil ⇨ Surface Water ⇨ Human | Human lifetime drinking surface water and ingesting fish containing pollutants in sludge |
| 13. Sludge ⇨ Soil ⇨ Air ⇨ Human | Human lifetime inhalation of pollutants in sludge that volatilize to air |
| 14. Sludge ⇨ Soil ⇨ Groundwater ⇨ Human | Human lifetime drinking well water containing pollutants from sludge that leach from soil to groundwater |

Table 3. Exposure Pathways Used in the Part 503 Risk Assessment

Consider as an example the use of a risk assessment to develop a standard for cadmium in sludge based on the risks posed by ingesting crops grown on sludge-amended soils. Plant uptake of cadmium as measured in various experiments varies widely (this is discussed more fully in a later section of this report). Dietary intakes also vary widely among the population. A deterministic analysis such as used by EPA uses a single value for uptake (EPA used the geometric mean of uptake coefficient data) and one value for diet (the average consumption circa 1980). In contrast, a Monte Carlo simulation makes use of the full range of data on uptake and on diet. The output of a Monte Carlo simulation enables analysts to identify the relationship between the concentration of cadmium in the sludge and the percentage of the population who will likely be protected at that level of application.

| Element | Limiting Pathway |
|---|---|
| Arsenic | Child Ingesting Sludge |
| Cadmium | Child Ingesting Sludge |
| Copper | Plant Phytotoxicity |
| Lead | Child Ingesting Sludge |
| Mercury | Child Ingesting Sludge |
| Molybdenum | Animal Eating Feed |
| Nickel | Plant Phytotoxicity |
| Selenium | Child Ingesting Sludge |
| Zinc | Plant Phytotoxicity |

Table 4. The Limiting Pathways According to the Part 503 Risk Assessment

While the US EPA and others made a major effort in performing the risk assessment supporting the Part 503 regulations, the authors of this paper demonstrate that there are fundamental errors in the assessment structure, a number of untenable assumptions made, and serious omissions (whether due to oversights or data gaps) which result in regulations that are not sufficiently protective. A precautionary approach such as that adopted by a number of other nations is more appropriate given the uncertainties inherent in such a complex risk assessment, potential long-term impact on agricultural productivity and the difficulty of remediation of any impacts resulting from soil contamination. Many of the pollutants of concern are not degradable and may remain in the soil for an extremely long time, although the bioavailability of contaminants may limit their impacts.

## Comparison Among Different Countries and Comparison with Cleanup Standards

Standards for sludges in a number of different countries are presented in Table 5. Comparisons require an understanding of how these maximum contaminant standards are applied. The standards in the top portion of Table 5 apply to products considered acceptable for use without significant restriction and are thus comparable. In general, home use of such products is permitted, though there may be some restrictions. Currently in NYS, for example, use in home vegetable gardens is not allowed.

US regulations for land application are less restrictive than those of many other countries. Allowable contaminant levels are higher than soil clean-up guidelines in the US and other countries.

For all contaminants except lead, the US EPA "EQ" standards are significantly higher than standards for sludge products allowed elsewhere for unrestricted use. In fact, US EPA rules allow the application of sludges with metal concentrations up to the ceiling limits (Tables 2 and 5) to be used in home gardens. Under the APLR approach, US EPA regulations allow bagged products to be distributed so long as a label states the maximum annual application rate. This policy has been criticized even by those otherwise relatively positive towards land application (National Research Council, 1996; Chaney, 1995). Since children ingesting sludge is the limiting pathway for many of the "EQ" contaminants (Table 4), application of sludges potentially containing up to the far higher ceiling concentrations of pollutants around homes seems inadvisable.

Sludges with contaminant concentrations listed in the bottom portion of Table 5 can be applied with some restrictions. To compare these standards and arrive at an understanding of what soil quality

| | As | Cd | Co | Cr | Cu | Hg | Mo | Ni | Pb | Se | Zn | PCB | NNP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Products - relatively unrestricted*** | | | | | | | | | | | | | |
| EPA EQ sludge[1] | 41 | 39 | | | 1500 | 17 | | 420 | 300 | 100 | 2800 | | |
| Texas compost, home use[2] | 10[3] | 16 | | 180 | 1020 | 11 | 75 | 160 | 300 | 36 | 2,190 | 1 | |
| Ontario clean compost[4] | 10 | 3 | | 50 | 60 | 0.15 | | 20 | 150 | | 500 | | |
| NYS Class I Compost[5] | | 10 | | 100 | 1000 | 10 | | 200 | 250 | | 1000 | 1 | |
| ***Sludges applied with restrictions*** | | | | | | | | | | | | | |
| EPA Ceiling limit sludge[6] | 75 | 85 | | | 4300 | 57 | 75 | 420 | 840 | 100 | 7500 | | |
| NYS sludge[7] | | 25 | | 1000 | 1000 | 10 | | 200 | 1000 | | 2500 | | |
| Denmark sludge[8] | 25[9] | 0.8 | | 100 | 1000 | 0.8 | | 30 | 120(60)[10] | | 4000 | | |
| Eur. Union sludge[11] | | 20-40 | | | 1000-1750 | 16-25 | | 300-400 | 750-1200 | | 2500-4000 | | |
| Germany sludge[12,13] | | 5/10[14] | | 900 | 800 | 8 | | 200 | 900 | | 2000/2500[14] | 0.2 | |
| Ontario dewater[15] | 170 | 34 | 340 | 2800 | 1700 | 11 | 94 | 420 | 1100 | 34 | 4200 | | |
| Ontario dewater, target[16] | 35 | 4 | 77 | 530 | 380 | 1.4 | 1.2 | 80 | 220 | 6 | 840 | | |
| Sweden sludge, 1994 | | 4 | | 100 | 1200 | 5 | | 50 | 200 | | 800 | | |
| Sweden sludge, 1998[17] | | 2 | | 100 | 600 | 2.5 | | 50 | 100 | | 800 | 0.4 | 50 |
| Netherlands sludge[18] | 0.15 | 1.25 | | 75 | 75 | 0.75 | | 30 | 100 | | 300 | | |
| Norway sludge ag[19] | | 2.5 | | 100 | 1000 | 3 | | 50 | 80 | | 800 | | |

Values are ppm=mg/kg dry weight.

Table 5. International Sludge Standards

[1] Unrestricted use if sludges contain less than these concentrations (US EPA,1993).
[2] Standards for grade 1 compost suitable for home use. Different standards apply to agricultural use (TNRCC, 1997).
[3] Based on background soil. 1 ppm would be risk-based allowable concentration (TNRCC, 1996).
[4] (Ontario Ministry, 1996).
[5] (NYS DEC, 1993).
[6] Can apply until cumulative load is reached or for bagged product which may be used anywhere can apply at annual rate.
[7] NYS DEC Part 360.
[8] There are higher alternative limits for metals based on the ratio of metals to phosphorus(Danish Ministry, 1996).
[9] As 25 for home garden use.
[10] Pb 60 for home garden use.
[11] Upper value is max member country may allow, lower is recommended max (Leschber, 1997).
[12] Max 5 metric tons/ha/3 yrs. (except compost 10 metric tons/ha/3 yrs if concentration <50% max). No use on fruit, vegetables, fodder crops, grazing land, forest.
[13] Germany has liability fund to which all producers must contribute to reimburse farmers.
[14] Value depends on pH.
[15] Max 4 applications. Max 8 metric tons/ha/5 yrs. or 135 kg/ha N/5 yrs. 40 metric tons/ha max lifetime of site.
[16] Unspecified date, target values.
[17] If concentrations are met may harvest crops one year after application. No application to pasture. If exceed concentration, use only for energy or industrial crops. Organics are voluntary targets. Max loading rates are also specified.
[18] 2 metric tons/ha/yr max application rate on arable land, 1 metric ton/ha/yrs. on pasture (Matthews, 1996). Sludge may be applied only if soils have less than specified concentration of metals (formula based on soil characteristics).
[19] Max sludge concentration for agricultural use (Miljoverndepartementet, 1997). 2 metric tons/10 yrs. max application rate (Matthews, 1996).

would result from application of a sludge, it is critical to know whether applications are limited in quantity and frequency. So, for example, Ontario allows application of sludges which exceed the US EPA ceiling limit for a number of contaminants, but total application is limited to 40 metric tons/ hectare or 4 applications. US EPA rules allow application of sludges with concentrations up to the ceiling limit, but for those not meeting EQ limits the total amount of any contaminant applied cannot exceed the cumulative limit (Table 2).

To facilitate a comparison, Figure 1 shows the allowable maximum concentration of cadmium and zinc in soils resulting from sludge application for a number of countries (Krogmann and Harrison, 1998). The levels allowed in the U.S. are far higher. Table 6 includes soil standards for the all of the contaminants regulated under Part 503. It includes calculated soil concentrations that would result from long-term application of sludge containing the cumulative limits of metals allowed under Part 503 and mixing that into a 15cm plow layer. A similar calculation is included for sludges regulated under NYS DEC rules. The actual metal levels would be higher since background soil metal concentrations are not included in the calculations. Typical agricultural soil levels are included in Table 6 for comparison.

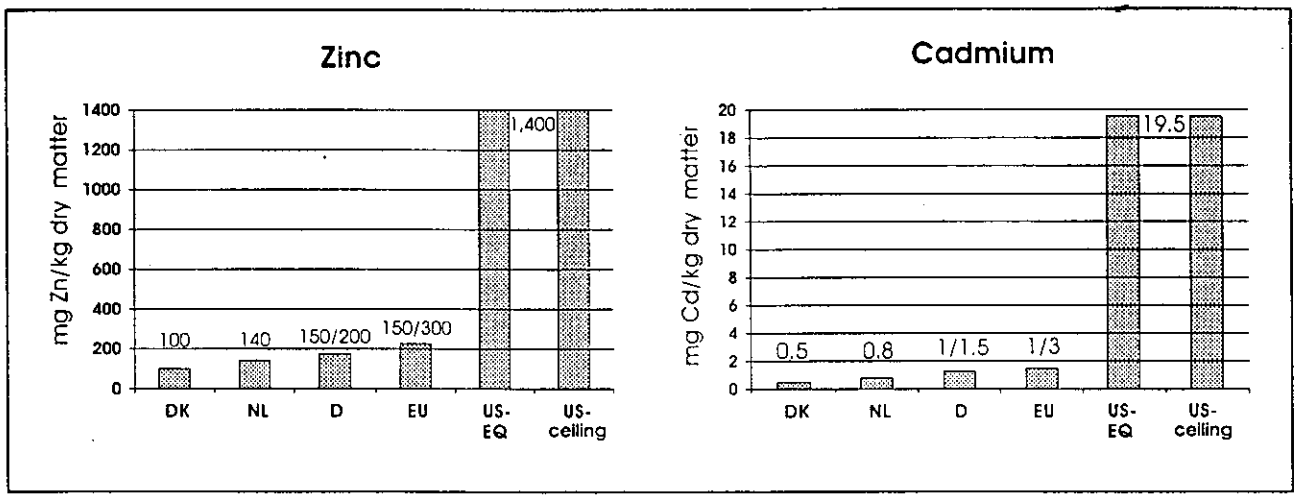



Figure 1: European and US Allowable Zn and Cd
Soil Concentrations Resulting from Sludge Application

Notes: German (D) values depend on soil pH. EU values are recommended and a maximum allowable concentration

The cumulative pollutant loading allowed under Part 503 would result in contaminant levels approximately an order of magnitude higher than those allowed under rules in European countries (Table 6) (McGrath, et al., 1994). Soil screening and clean up numbers used by US EPA, NYS DEC and the Netherlands (intervention value) are also included. These US EPA and NYS values used in considering the need for remediation of contaminated sites are significantly lower than the values which sludge application would allow. NYS numbers are based on a goal of cleaning up sites to background concentrations (NYS DEC, 1994), while the US EPA numbers are based on an assessment of risks posed by soil ingestion and groundwater (US EPA, 1996). A site or soil background concentration is used when the risk-based number is lower than the background. The values for soil in other countries include both goals for soil quality and maximum levels allowed for contaminant accumulation as noted in Table 6. All of these various soil levels are all far lower than those allowed under Part 503. The Dutch intervention values were derived using a risk analysis similar to that used for Part 503, yet the values they suggest for soil clean-up of serious contamination are generally low or lower than those suggested by US EPA to pose no significant threat (McGrath, et al., 1994).

| | As | Ba | Cd | Co | Cr | Cu | Hg | Mo | Ni | Pb | Se | Zn | PCB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Part 503 calculated sludged soil[1] | 20 | | 20 | | | 750 | 8.5 | | 210 | 150 | 50 | 1400 | |
| EPA soil screening[2] | 0.4 | 82 | 0.4 | 30/SB | 2[3] | | | | 7 | 400 | 0.3 | 620 | 1[4] |
| NYS calculated soil[5] —Ag soils classes 1-3 | | | 1.4 | | 138 | 35 | | | 14 | 138 | | 69 | |
| NYS calculated soil —Ag soils classes 4-10 | | | 1.8 | | 205 | 52 | | | 21 | 205 | | 103 | |
| NYS calculated soil —Non-agricultural soils | | | 4.6 | | | 115 | | | 69 | 460 | | 230 | |
| NYS soil clean up goals[6] | 7.5/SB | 300/SB | 1/SB | | 10/SB | | 0.1/SB | | 13/SB | SB | 2/SB | 20/SB | |
| Ontario soil[7] | 14 | | 1.6 | 20 | 120 | 100 | 0.5 | 4 | 32 | 60 | 1.6 | 220 | |
| Germany soil[8] | | | 1/1.5[9] | | 100 | 60 | 1 | | 50 | 100 | | 150/ 200[9] | |
| Netherlands soil target[10] | 29[11] | 200 | 0.8 | 20 | 100 | 36 | 0.3 | 10 | 25 | 85 | | 140 | 0.02 |
| Netherlands intervention[12] | 55 | 625 | 12 | 240 | 380 | 190 | 10 | 200 | 210 | 530 | | 720 | 1 |
| Norway soil[13] | | | 1 | | 100 | 50 | 1 | | 30 | 50 | | 150 | |
| Average N. Amer. Agricultural Soils | 6[14] | - | 0.1-0.3[15] | - | 15[14] | 10-30[15] | 0.05-0.1[14] | 1-2[16] | 10-30[15] | 10-20[15] | 0.3-0.4[16] | 40-70[15] | |
| 95 percentile N. Amer. Agricultural Soils | 10-20[17] | | 0.78[18] | | | 95[18] | 0.3-0.4[17] | 3.0[17] | 57[18] | 23[18] | 1-1.5[17] | 126[18] | |

Values are ppm=mg/kg dry weight.

Table 6. International Soil Standards for Metals

[1] Resultant soil conc. calculated when the cumulative load limit from Part 503 is mixed into the plow layer. Actual levels would be higher due to background level in soil.
[2] Generic soil screening levels based on human health risk assessment of soil ingestion and groundwater pathways. SB=Soil Background (USEPA, 1996).
[3] 2 ppm listed for total chromium but concern is Cr (VI).
[4] Based on superfund guidance (USEPA, 1990).
[5] Resultant soil conc. calculated when cumulative load limit in Part 360 (NYS DEC, 1993) is mixed into plow layer. Actual levels would be higher due to background level in soil. Different cumulative limits are applied to different soil classifications.
[6] SB=Soil Background (NYS DEC, 1994).
[7] Max soil conc allowed includes background soil levels.
[8] No sludge additions to soils which exceed these levels.
[9] Depends on pH.
[10] Desired soil quality. Values vary with caly and humus content.
[11] Netherlands TDIs are different than US. For As, NL is 0.0021 vs. 0.0003 IRIS (USEPA database), vs. 0.0008 in 503. Netherlands risk assessment does not include groundwater path because there are essentially no private wells in Holland.
[12] Level at which clean up needs to be considered.
[13] Maximum soil concentration.
[14] Value for southern Ontario soils (Frank, et al., 1976).
[15] NYS average values taken from Holmgren, et al., 1993.
[16] Typical U.S. Soils (Logan & Traina, 1993).
[17] Approximately 95% of Easterm U.S. soils would fall at or below this value (Shacklette and Boerngen, 1984).
[18] Approximately 95% of U.S. agricultural soils would fall at or below this value (Holmgren, et al., 1993).

## Alternative Policy Approaches

The US rules allow sludges to be applied up to a maximum acceptable contaminant limit. In other words, through a risk assessment some contaminant level is selected as a maximum level to which people, crops or other receptors can be exposed without creating unacceptable harm (as defined by the assumptions in the risk assessment). Pollutants present in sludge may then be added up to that limit. Thus, if it is concluded that exposure to 50 micrograms per day of contaminant X through food is acceptable, the Part 503 rules calculate the maximum amount of contaminant X which could be in sludge and not result in more than 50 micrograms per day in the diet. Obviously, many assumptions go into all phases of this calculation and under the Part 503 risk assessment, no safety factors were applied.

In contrast, several European countries (Sweden, Denmark, the Netherlands) use a philosophy of "do no harm" to protect soil quality. Their approach to achieving sustainability is to work towards limiting inputs to the soil so they do not exceed outputs, thus preventing accumulation of pollutants in the soil (McGrath, et al., 1994; Munters, 1997; Witter, 1996). The "do no harm" philosophy of environmental management strives to limit the addition of contaminants to the levels that are present in uncontaminated soils while recognizing the inherent uncertainty involved in risk modeling. This "no net degradation" approach is precautionary–it permits land application of inorganic contaminants only to the extent to which there will be no accumulation above levels in uncontaminated agricultural soils. In setting clean up objectives for remediation of contaminated sites in NYS, this philosophy was embodied in the use of soil background numbers for the inorganic contaminants (See Table 6) (NYS DEC, 1994).

US regulations are based on calculations of acceptable risk. The data gaps, uncertainties, irreplaceable value of agricultural land, and persistence of contamination have led several European countries to adopt a different approach in which they strive to prevent the accumulation of metals above levels present in uncontaminated soils.

Since there is a range of metal levels in uncontaminated soils resulting from differences in site geology and other factors, a limit may be set at the level found in no more than 10% (or 1%) of such soils. Thus 90% (or 99%) of uncontaminated soils would have less than the regulated limit. Such a "no net degradation" policy would result in levels for the 9 regulated metals that are much lower than those established under Part 503.

The values for some elements determined through a risk assessment may be lower than those found in some uncontaminated soils. In examining arsenic, for example, a limit of 1 ppm was determined through the risk assessment performed in Texas, while background levels in soils exceeded that number (TNRCC, 1996). This led Texas to adopt an arsenic standard of 10 ppm based on the values in soils.

Some would suggest that calculations which show acceptable risk levels to be lower than background soil levels indicate that the risk assessments are overly conservative and for some risk assessments the application of safety factors may provide a conservative margin. However, the inorganic elements present in soils may be significantly less bioavailable than those same elements added in sludge or other anthropogenic additions. The chemical form in which an element is present plays a critical role in its biological impact.

Since the concentration of contaminants allowed under the Part 503 regulations in the US in sludges applied to land is markedly greater than the concentration in agricultural soils (Table 6), over time the levels of any persistent contaminants like heavy metals will increase in soils to the level in the sludge being applied. Recent evidence, however, suggests that losses of certain metals through leaching is not always negligible, so there may be removal of some fraction of the metals through groundwater (Camobreco, et al., 1996; Richards, et al., 1997).

## Sludge Quality

Sewage sludges vary widely in the concentration of contaminants. Efforts to remove industrial contaminants through pretreatment programs have resulted in greatly improved quality over the last decade in the US. As shown in Table 7, the mean concentrations of the regulated contaminants in both the US and NYS sludges are far lower than the US EPA "EQ" standards. In fact, 95% of NYS sludges fall far below those standards for most contaminants, indicating that stricter standards would be achievable today for most sludges.

Sludge quality has improved and there are opportunities for continuing to reduce pollutant levels.

Most US sludges could meet stricter standards than Part 503.

Pollution prevention efforts in a number of European countries have greatly reduced contaminant concentrations and have resulted in sludges which are able to meet much more stringent limitations for cadmium (<2 ppm) (Madsen, 1997; Tidestrom, 1997b; Witter, 1996). While control of industrial sources can help to reduce many contaminants, others, such as copper and lead, result in part not from industrial sources but from leaching of pipes including those in our homes. Efforts to decrease the corrosivity of water supplies can help to reduce their concentrations. There is some evidence that low levels of dioxins come from residential sources (washing of textiles) which may make them difficult to control in sludges (Horstmann and McLachlan, 1995; McLachlan, Horstmann and Hinkel, 1996).

| | As | Cd | Cr | Cu | Pb | Hg | Mo | Ni | Se | Tl | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Part 503 "EQ" Standard | 41 | 39 | - | 1500 | 300 | 17 | - | 420 | 100 | - | 2800 |
| U.S. Sludge (mean)[1] | 10 | 7 | 119 | 741 | 134 | 5 | 9 | 43 | 5 | 5 | 1202 |
| N.Y.S. Sludge (mean)[2] | 6 | 7 | 86 | 763 | 152 | 2.7 | 18 | 44 | 5 | - | 887 |
| N.Y.S. Sludge (95 percentile) | 13 | 18 | 242 | 1600 | 403 | 7 | 57 | 110 | 9 | - | 1750 |

Values are ppm (mg/kg)

[1] Data from 1988 National Sewage Sludge Survey (US EPA, 1990).
[2] Data from early 1990's (NYS DEC Division of Solid and Hazardous Materials).

Table 7. Metal Levels in Sludges

In addition to sludge quality improvement, wastewater treatment technologies which minimize sludge production are being developed, thus decreasing the need for disposal. Other technologies to recover energy or fuel gas from sludges also hold some promise for development of beneficial use options beyond land application.

## Alternative Land Application Uses

Some uses of sludges present less risk than use on agricultural lands and home grounds.

The significance of risks posed by land application of sludges varies according to different use scenarios. For example, since the potential for a child to ingest sludge is much greater for sludge used by residential gardeners than for sludge applied to field corn, stringent limitations based on this pathway should apply to home use but may not be necessary for agricultural use. Conversely, groundwater contamination may be a concern where sludges are applied to large acreage but will not likely be a concern for smaller scale residential use. While this paper focuses on the potential use of sludges on lands used for growing

agricultural crops, there are numerous other land application scenarios which present less risk. Among these are application to turf such as golf courses, roadsides or parks, reclamation of severely disturbed lands, or application to biomass plantations. Development of different standards for different end uses would recognize the variation in risks and benefits and permit the use of sludges where most appropriate.

## Non-Protective Aspects of US EPA Part 503 Risk Assessment

Discussed below are a number of the assumptions and decisions which are part of the US EPA risk assessment for Part 503 that the authors believe to be questionable and which are not conservative or protective.

### 1. Allows pollution to reach maximum "acceptable" level

Through a risk assessment some contaminant level is selected as a maximum level to which people, crops or other receptors can be exposed without creating unacceptable harm (as defined by the assumptions in the risk assessment). Pollutants present in sludge may then be added up to that limit.

> In establishing Part 503 regulations, the policy choice made is that pollutants can be added up to the level which represents some determination of the acceptable risk. No safety factor is applied, leaving no margin for error nor for future changes in determination of what levels represent an acceptable risk.

For example, sludge application would be allowed to raise groundwater contaminant levels up to the drinking water standard or increase contaminants in crops up to the level considered to represent an acceptable risk. The philosophy behind this approach depends on an accurate knowledge of pollutant pathways, processes and impacts. The impact of other sources of pollutants (e.g. atmospheric deposition) and change over time in both pollutant inputs and knowledge of impacts (e.g. the hormone disrupting effects of some synthetic organic chemicals, which is likely to result in a decrease in the allowable maximum contamination levels for those chemicals) makes this an uncertain and potentially non-protective approach. Without a very good understanding of pathways and processes, allowing pollutants to reach calculated maximum acceptable values is unwise. It leaves no room for the possibility that as our understanding of impacts increases, maximum acceptable values will be lowered (e.g., standards for lead have decreased over the years; our knowledge of hormone disruption impacts at low chemical concentration is increasing). Once contaminated, soils are difficult to remediate. Alternative approaches are discussed in the section on alternative policy approaches above.

### 2. No safety or uncertainty factors

The uncertainties inherent in a risk assessment, originating from both missing data and a lack of understanding of how available data should be applied to complex systems with inherent biologic variation, argue for the application of safety factors. Many risk assessment-based standards divide calculated numbers by 2, 10, 100 or even 1000 depending on the level of uncertainty or the applicability of available data. The Dutch risk assessment, for example, assigns uncertainty values of 1, 2 or 3 based on the number and quality of data available for the particular variable being assessed (van den Berg, 1994).

### 3. Evaluates each exposure pathway separately not accounting for multiple pathways of exposure or synergy

It is likely that in a number of sludge use scenarios, a person or animal will be exposed simultaneously through a number of pathways. Thus the child of a home gardener using sludge will likely eat vegetables from the garden (pathway 2, Table 2) and may ingest soil that has received sludge (pathway 3). They may also drink from a well or eat animals or animal products that have been impacted by sludge use. The US EPA risk assessment calculated "acceptable" risk according to each of 14 pathways and selected as a standard the lowest of those numbers. They did not add exposures from several paths to arrive at a level from the multiple exposures which would result in an "acceptable" risk. An additive approach is generally used in performing risk assessments (van den Berg, 1994; Duff, 1996; Lund, 1997).

Where sludges are used, exposure to contaminants will come from a number of routes (e.g., eating sludged crops, ingesting sludged soil, drinking water which has received some sludge contaminants). Most risk assessments take this into account by adding exposures from different pathways but the Part 503 risk assessment does not.

Similarly, the risk assessment did not attempt to address the ways in which the effects of exposure to multiple chemicals simultaneously can affect the toxicity impacts. While estimating exposure and risk to a single pollutant from a number of pathways simultaneously could be done by summing results from different pathways, our lack of knowledge about how different contaminants interact makes it infeasible to evaluate impacts resulting from exposure to multiple pollutants. There can be synergistic or antagonistic impacts in which exposure to multiple chemicals has a greater or lesser impact than exposure to each. Our very limited knowledge of how different contaminants may interact is one reason for skepticism regarding risk assessment and for the use of a more conservative approach.

### 4. Calculates cancer risk of 1-in-10,000 vs. 1-in-1,000,000

US EPA made a policy decision that a cancer risk of 1-in-10,000 was an acceptable risk resulting from sludge application. For a number of contaminants, cancer risk was determined to be the most significant risk. A cancer risk estimated to lie between 1-in-10,000 and 1-in-1,000,000 is typically used in setting regulations and in many regulatory contexts (e.g. drinking water regulation), a risk of one excess cancer in one million people exposed is used to establish the standards. Under the 503 risk assessment, policy makers elected to use the less restrictive value.

Standards for carcinogens based on a risk assessment depend on what rate of increased cancer is considered acceptable. Values between one excess cancer in 10,000 to 1,000,000 people are typically used. A 1-in-10,000 risk was used in the Part 503 risk assessment.

### 5. Soil ingestion rate

Children inadvertently ingesting sludge via the soil is calculated by US EPA to be the most restrictive pathway for 5 of the 9 regulated metals (pathway 3, Table 3). The Part 503 risk assessment calculated risk for a child eating 200 mg/day for 5 years. (For perspective, 200 mg equates to about the volume of an aspirin tablet.) Two aspects of this analysis may not be protective. First, the data regarding ingestion are limited and 200 mg/day of soil may be low. Second, through normal activities, inadvertent ingestion continues throughout life, though at lesser rates (although rates may actually peak in teenage years). Other risk assessments include child ingestion rates for several years and a lower adult ingestion rate (the Dutch and Texas risk assessments use 50 and 100 mg/day for adult ingestion [TNRCC, 1996; van den Berg, 1994] ) for the remaining lifetime.

All young children ingest some soil as part of their normal behavior. The regulation seeks to protect the "average high-end child" (not defined). There are children who ingest far more than average (so-called pica children), and the regulation clearly states that it does not seek to protect these children.

A key piece of data is just how much soil children actually ingest. Collecting data on this is difficult and there are only a few studies to draw from. The primary study monitored 24 children for 8 days in Massachusetts. The range for each child and the day-to-day variation were large. The average rate derived was 200 mg/day. However, there is no clear agreement on the appropriate statistical approach to extrapolating from these few children and few days to an annual rate for an "average high-end child" (Stanek and Calabrese, 1995). Thus there is concern that the regulatory limits based on 200 mg/day soil ingestion may not be conservative enough to protect children who may be exposed, particularly in a home garden scenario.

## 6. Underestimates pollutant intake through food

### Assesses diet very low in vegetables

Dietary intake is a critical parameter for calculating risk from pathways 1 and 2. An average late 1970s diet was used in the risk assessment. Americans, responding in part to the USDA recommended diet, are eating significantly greater amounts of fruits and vegetables. Recalculations based on the USDA recommended diet of the risk associated with eating from a home garden receiving sludge show that the US EPA standard for cadmium would exceed the "acceptable" daily intake.

The risks posed through eating foods grown on sludge-treated lands depend on assumptions about how much of those crops are eaten and how much of a contaminant is taken up by the crops.

US EPA assessed two scenarios, one for the general population and a second for the home gardener. The risk assessment assumes 2.5% of the vegetables eaten by the general population were grown on sludge amended soils. While this may be a reasonable guess for the nation as a whole, states with high populations, such as NYS, may ultimately have a much higher proportion of sludged agricultural land, though how this relates to the percentage of a person's diet depends greatly on how locally their food is obtained. The recent trend for consumers to buy "shares" in produce from a given farm could expose some individuals to much more than the average, though less than the home gardener. For the home gardener, the US EPA assessment assumes 59% of most vegetables eaten are grown in the home garden which received sludge.

Dietary assumptions used in the risk assessment make use of what the average American ate in the late 1970s for both the general population evaluation and for the home gardener evaluation (US EPA, 1992). This diet is very low in fruits and vegetables, and the population is now eating more of these components of the diet that contribute the majority of cadmium intake (Chou, 1991; Heirmendinger and van Duyn, 1995; Krebs-Smith et al., 1995). In particular, home gardeners can be expected to eat significantly more vegetables than the average American. A comparison was made of the diet evaluated in the risk assessment by US EPA and of the diet recommended by USDA in the food pyramid (USDA, 1996). Seen in Figure 2, the amount (in dry weight) of vegetables, fruits and grains recommended by USDA is about two and a half times that used by US EPA. For leafy vegetables, which are a major source of dietary cadmium, the US EPA diet is one sixth the USDA recommended amount. The recommended diet contains more than 16 times the amount of fruit as the US EPA diet used in the Part 503 risk assessment.

Americans are eating more vegetables than the amount used in calculating the Part 503 standards.

USDA recommendations are far more than that amount.

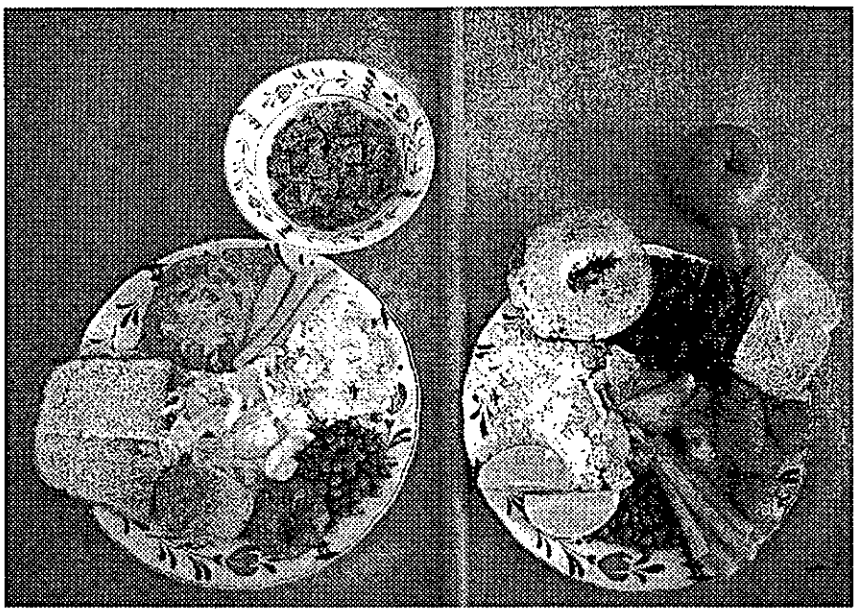


Figure 2. Diet Used in the Part 503 Risk Assessment Compared to USDA Recommended Daily Vegetable Intake

| Left: Daily vegetable, fruit and grain in diet used in the 503 risk assessment | Right: *Additional* vegetable, fruit and grain in the USDA recommended diet |
|---|---|
| Foods shown: cereal, tomato, carrots, rice, peas, cookie, potato, bread, lettuce | Foods shown: apple, bagel, greens, bread, strawberries, carrots, peas, orange, rice, lettuce, 1/2 potato |

Since the sludge–soil–plant–human pathway risk analysis depends on the amount of fruits, vegetables and grains consumed, revising dietary assumptions leads to very different standards. For example, using US EPA's assumptions and calculating allowable application of cadmium, changing only the dietary assumptions to those of the food pyramid, leads to a standard for cadmium of 15 ppm as compared to the current federal standard of 39 ppm. Even this may not be protective, as discussed below.

### Very low plant uptake coefficients

A knowledge of how much of the metals added to soils end up in crops is key to calculating standards for pathways 1 and 2 (general population and home gardeners eating crops from soil to which sludge has been applied). Data establishing the relationship between the amount of a contaminant added and its rate of uptake by different crops vary widely. In the part 503 risk assessment, US EPA used the highly non-conservative geometric mean of the data and included data from all soils, including those with high pH. Recalculating "acceptable" levels using the arithmetic mean or the 90th percentile for uptake coefficients results in a lower standard.

Uptake coefficients, which express the amount of a metal taken up by a plant compared to the amount applied to the soil, are critical to a number of the pathways in the risk assessment. The higher the uptake coefficient, the greater is the fraction of the metal which accumulates in the plant. Uptake coefficients are critical for assessing the pathways that examine people eating sludged crops (pathways 1 and 2) and also the phytotoxicity pathway (pathway 8, Table 2, which assesses negative impact on plant growth resulting from accumulation of some metals, discussed below).

The authors and others (Stern, 1993; Chaney and Ryan, 1994) are concerned that the uptake coefficients used in the US EPA risk assessment are too low, particularly in regard to the northeastern US, where acid soils are common. Also, the uptake coefficients calculated by US EPA include data from lime-stabilized sludges which have an immediate effect of raising the soil pH, which in turn reduces availability of cadmium and zinc, an effect that cannot be expected to persist in the long term.

Many studies in the field and greenhouse have tried to measure the rate at which a crop takes up a particular metal from the soil. Unfortunately there is a great deal of variation (the data used by US EPA vary by 4 orders of magnitude for cadmium uptake coefficients, a factor of 10,000), depending on many factors including specific variety of crop (not just lettuce versus beans, but the particular variety of lettuce), soil characteristics such as cation exchange capacity, pH, moisture conditions, and many other factors.

The amount of a contaminant taken up by a plant (uptake coefficient) varies greatly depending on a number of factors.

The Part 503 rules are based on very low uptake coefficients which are lower than those of many sites and soils.

In selecting uptake coefficients for the risk assessment, US EPA used the geometric mean of available field data, which results in a much lower number than that obtained if other statistical approaches are used. The uptake coefficient is different for each metal and varies among crops. Since cadmium uptake into crops and subsequent ingestion is a potentially limiting pathway, cadmium is used as an example in the following analysis. While the geometric mean for the uptake coefficient for cadmium in leafy vegetables (a crop type that has a high uptake rate) used by US EPA in the risk assessment is 0.182, the arithmetic mean of the same data is 0.630. A probabilistic Monte Carlo analysis of the distribution of uptake coefficient values from the data used by US EPA (for soils with pH <6.5) determined that 10% of the distribution showed an uptake coefficient of 2.87 or higher and far more than half the data had levels greater than the level used in the risk assessment (Stern, 1993). For more than 50% of all soil conditions represented in the risk assessment, the uptake coefficient–and thus the risk posed by cadmium uptake into crops–is underestimated (McBride, 1998a). Because geometric means are biased towards low values, their suitability for use in risk assessment is questionable (Parkhurst, 1998).

For some metals (including lead and mercury), measurements of uptake coefficients appear to be compromised by either analytic limitations or by physical contamination of "control" crops (McBride, 1998a). A number of field plot experiments used in the EPA risk assessment showed low or even negative uptake of these metals. However, the reported concentrations of these contaminants in the control (non-sludged) plants are far higher compared to levels in farm-grown crops in areas remote from sludged sites. Since uptake coefficients are based on the comparison of concentration in the sludged to the control plots, high levels in the controls underestimate uptake. The controls should instead represent levels in uncontaminated crops and the elevated levels in the sludge experiment control samples indicate that either the controls were contaminated physically by soil particles carried over from the sludged plots or that there were analytical problems (McBride, 1998a).

### Averages are not applicable to particular site or crop

Use of averages or means is not a valid approach for some exposure pathways since a particular crop (which may be highly sensitive or accumulate metals more readily) will be grown on a particular site which may have soils that result in high uptake of contaminants by the crop. Similarly a farmer may be growing a crop that is very sensitive to phytotoxic metals on soils that promote high uptake, leading to low crop yields. The US EPA risk assessment, then, in using the geometric mean for uptake coefficients does not apply conservative estimates and is thus not highly protective. A more protective approach would use data from sensitive crops and soils with high uptake coefficients.

### Cadmium levels under different assumptions

> Application of different data and assumptions regarding diet and uptake coefficient results in acceptable cumulative loadings for cadmium that differ by a factor of 80.

Different assumptions regarding the appropriate uptake coefficient to use for cadmium in the calculations for pathway 2 (home gardener applying sludge and eating crops) result in very different allowable cadmium levels in sludge (Table 8). For pathway 2, the US EPA risk assessment number is 120 kilograms/hectare (kg/ha) cumulative cadmium loading. Applying assumptions about depth of tilling into soil, this is equivalent to 120 ppm cadmium in "EQ" sludges. (Note that the Part 503 standard of 39 kg/ha is derived from Pathway 3.) Correcting for the diet recommended by USDA versus the low vegetable diet used in the risk assessment, but using the same geometric mean for uptake coefficient and the same assumptions regarding the acceptable increase in dietary exposure to cadmium, the cadmium limit calculated is 15 kg/ha or 15 ppm. If instead the arithmetic mean of the data is used for the uptake coefficient, 5 kg/ha or ppm is calculated. For this pathway, application of the values derived from a Monte Carlo analysis show that a maximum Cd contaminant level of 1.5 kg/ha or ppm is calculated to be protective of persons gardening in 90% of the slightly to strongly acidic soils included in the data base and eating the USDA recommended diet. As seen in Table 5, other countries have adopted cadmium standards approaching this low limit. While currently many NYS sludges could not meet this limit, with aggressive pollution prevention this number could be achieved as seen by the fact that many European sludges are able to meet their more stringent limits.

| Acceptable Cd Cumulative Limit | Basis |
|---|---|
| 120 | EPA calculation based on geometric mean UC and average late 1970s diet |
| 15 | Concentration based on geometric mean UC and USDA recommended diet |
| 5.4 | Concentration based on arithmetic mean UC and USDA recommended diet |
| 1.5 | Concentration based on Monte Carlo 90th percentile UC and USDA recommended diet |
| 39 | EPA cumulative limit based on child ingestion pathway |

Values are in kg/ha.

Table 8. Cadmium Standard Calculated Using Different Assumptions Regarding Diet and Uptake Coefficient (UC)

### 7. RfD for Arsenic of 0.0008 mg/kg/day vs. 0.0003 or less

The reference dose (RfD) of a toxic chemical is the daily exposure over a lifetime likely to be without "appreciable" risk. It is expressed as the amount which can enter the body per kilogram of body weight per day. For arsenic, there is some uncertainty regarding the recommended maximum level. US EPA believes it to fall within the range of 0.0001-0.0008 mg/kg/day. US EPA selected the least conservative number (0.0008 mg/kg/day) in the Part 503 risk assessment despite the fact the RfD used by US EPA in other programs is 0.0003 mg/kg/day (US EPA, 1992, p. 5-107). A recalculation using the same assumptions as US EPA in the Part 503 risk assessment except for the use of an RfD of 0.0003 mg/kg/day for arsenic, produces an acceptable limit of 1 ppm arsenic in sludge products based on pathway 3, child ingestion of soil (TNRCC, 1996).

## 8. Many pollutants not regulated or monitored

### Pollutants present in less than 10% of sludges not considered

A key issue is the very limited number of contaminants that are regulated under Part 503. In developing the rules, US EPA used a national perspective, not considering contaminants "infrequently" found in sludges. In the first round of regulation development which led to the Part 503 rules, there was no formal definition of the frequency of detection necessary for consideration nor was there a consistent data base of sludge quality from treatment plants in the US. That was one reason why US EPA sponsored the National Sewage Sludge Survey in 1988 (US EPA, 1990). For Round 2 of regulation development which is underway, contaminants found in 10% or fewer of sludges (determined by the 1988 survey) were not considered significant enough to regulate. However, in up to one out of ten sludges, these contaminants may be present and possibly at levels of concern.

A wide variety of contaminants have been found in sludges. Part 503 regulates only 9. While most sludges do not have high levels of non-regulated contaminants, without testing a user has no way of knowing what unregulated sludge contaminants are present.

While on a national scale the risks posed by such contaminants may be low, the particular sludge which a grower or home gardener may use might in fact have significant levels of some unregulated contaminants. Since no monitoring is required for these contaminants, users would have no way of knowing. Consider, for example, a hypothetical small city where an industry infrequently discharges a highly toxic contaminant not included in the Part 503 rules. A survey of sludges from 24 central NYS communities and another of 30 sludges from around the US documented just such a concern, finding elevated levels of various exotic contaminants in sludges from communities in which a particular industry was located (Mumma, et al., 1983; Mumma, et al., 1984).

### Pollutants with insufficient data

Another rationale for not setting standards or requiring monitoring is the inability to adequately assess risks due to a lack of data to complete the risk assessment. Lack of adequate data is a serious limitation to the usefulness of risk assessment, but ignorance is not a solution to uncertainty. Currently, US EPA rules only require monitoring for regulated contaminants. Testing sludges for a wider range of priority pollutants and for dioxins and furans would not include all of the thousands of chemicals that might be present, but would be a step towards knowing what is being spread on land. One issue with wider testing is that the significance of detecting contaminants for which there are no regulatory limits is unclear. The data on many chemicals is not adequate to assess their impacts. Finding chemicals through wider testing, however, can at least alert us and research can be undertaken to assess their effects. The current position of US EPA that further research is not needed on land application of sludges is inconsistent with the arguments of insufficient data used to eliminate many contaminants from consideration for regulation.

EPA determined that data for some pollutants were insufficient to perform a risk assessment and thus develop standards. The risks posed by some of these suggest a need for further study and regulation. Currently, EPA has eliminated them from consideration in Round 2 of regulation development and proposes no further research.

In their Round 2 evaluation of additional pollutants in sewage sludges, US EPA identified an additional twelve inorganic and organic chemicals beyond those regulated in Part 503 that are potentially harmful by one or more exposure pathways. The arguments ultimately used to exclude all but two of these (coplanar PCBs and dioxins/dibenzofurans) from further consideration can be called into question; most are based on a lack of data.

If the leachability of beryllium and barium is assumed to be as high as has been measured in acid sandy soils, both of these elements would have been subject to regulation to limit groundwater contamination (US EPA, 1996b). For barium, US EPA in the risk assessment used the lowest rather than the highest or median measured leachability for acid sandy soils, based on a single experiment. For beryllium, the median value of leachability was used.

US EPA excluded boron and fluoride from regulation despite both elements having critical pathways (pathway 6 for boron, pathways 6 and 10 for fluoride [Table 3]), arguing that the experiments from which this initial assessment of potential impact was derived did not measure transfer into biota from boron and fluoride in soils amended specifically with sludges. Since no information was available on uptake of either element from sludge into crops, US EPA concluded that the pathways could not be evaluated with existing information, and that boron and fluoride should not be regulated. However, both of these elements occur as anions and may not be strongly adsorbed in the sludge matrix. The initial solubility of boron in some sludges and composts is especially high, such that boron phytotoxicity in crops grown on soils recently amended with sludges has been observed (Chaney and Ryan, 1993). It is questionable whether it is reasonable to assume little transfer to animals and soil biota given the absence of data.

### Synthetic organic chemicals

No organic contaminants are currently regulated under 503. The US EPA eliminated from consideration any organic contaminant that met any of the following three criteria. The criteria used were: 1) the pollutant has been banned for use in the US or it is not being manufactured for US use; or 2) it has been detected in 5% or fewer of the sludges tested in the National Sewage Sludge Survey; or 3) the 1-in-10,000 cancer risk limit was less than the concentration found in 99% of the sludges tested. Thus, even persistent synthetic organic chemicals found to be present in more than 5% of sludges were eliminated from regulation if they were no longer being manufactured (US EPA, 1992, 1995).

Current US rules contain no standards or testing requirements for organic chemicals. Standards for coplanar PCBs, dioxins, and furans are proposed for future development by the EPA.

A number of synthetic organic detergent additives are found in high levels in sludges and are regulated in some European countries.

PCBs are an example of a class of organic contaminants generally found at low levels, but at high levels in some sludges. The risk assessment performed by US EPA shows that 4.6 ppm would be the limit for acceptable risk using a 1 in 10,000 cancer risk. In contrast, the rules in Texas set a 1 ppm standard for residential use and the Dutch clean-up intervention value is 1 ppm in soil (Tables 5 and 6) (Texas, 1996; van den Berg, 1994). A reassessment of pathway 5 by Chaney et al., arrived at a limit of 2.23 ppm for PCBs based on the pathway of a farm family consuming meat (Chaney, et al., 1997), but for a number of reasons the US EPA rules were stated to be adequately protective (Chaney, et al., 1996). Recent monitoring demonstrates that wastewater treatment plants are active sources of PCBs, and a majority of the PCBs contained in influents to wastewater plants are preferentially removed from the water into the sludge (Delaware River Basin Commission, 1998; Durell and Lizotte, 1998). Non-detection of PCBs from wastewater plant discharges in earlier studies may be partially due to analytical problems resulting from the fact that severely weathered samples no longer retain the congener "signature" of the original PCB mixtures and are thus not recognized by traditional laboratory methods (Delaware River Basin Commission, 1998).

PCBs are not regulated under Part 503 because they are no longer being manufactured in the US. PCBs, dioxins, and many other chlorinated synthetic organic chemicals are persistent, slow to degrade,

and they bioaccumulate. More than 50% of dioxins and furans were still present in soils 20 years after sludge application (McLachlan, et al., 1996; McLachlan, Horstmann and Hinkel, 1996). Most sludges contain low levels, but some individual sludges contain significant amounts. Monitoring of persistent synthetic organic chemicals such as PCBs is not required under US EPA rules but has been recommended, even by researchers who believe the toxicity risk from these chemicals resulting from land application of sludges is very low (Chaney, et al., 1996). Again, this is a case of the 503 regulations dealing with "average" rather than specific conditions. While it is stated that "PCB concentrations will limit use of biosolids from only a few of the 14,000 POTWs [publicly owned treatment works] in the US" (Chaney, et al., 1996), without testing a sludge user would have no way of knowing if the sludge or sludge product they are applying is one of those few. The particular pathway of concern is ingesting sludge. In addition, since PCBs (and other persistent, fat soluble toxic organics) bioaccumulate in animal fats, ingestion of sludges containing such organics by cattle could be a concern regarding milk and meat quality.

Dioxins and furans are a series of related compounds, some level of which are found in all sludges (McLachlan, Horstmann and Hinkel, 1996; US EPA, 1990; US EPA, 1996a, c). Since the toxicity of the different particular types (known an congeners) varies widely, US EPA and others have defined toxic equivalency factor (TEQ) which is a calculated number varying from 1 for 2,3,7,8 TCDD, the most toxic, to 0.001 for other less toxic types. To calculate the total risk posed by dioxins and furans in a sludge, the concentration of a particular type of dioxin or furan is multiplied by the toxicity factor for that particular type and then summed for all the dioxins and furans that are present to arrive at a total TEQ. Levels in US sludges vary widely, with a mean value of 10 to 20 nanograms/kg TEQ, but some sludges have a TEQ over 100 ng/kg. While no regulations are in place regarding the land application of materials containing dioxins, an agreement between the paper companies and US EPA regarding land application of paper mill sludges established 10 ng/kg TEQ as the limit for unregulated spreading and paper sludges containing over 50 ng/kg are not to be land applied. For levels between 10 and 50 ng/kg TEQ, site specific evaluation would govern use. There are thus a number of sewage sludges which would not be spread under these criteria. It has been suggested that dioxins may be a limiting factor in the application of sludges in Ontario where there is a risk-based soil clean up level for dioxins of 10 ng/kg TEQ (Campbell and Webber, 1997; Webber and Nichols, 1995). Dioxins and furans and co-planar PCBs are the only additional pollutants which US EPA is proposing to address in Round 2, which is expected to take several years. In the meantime, federal rules do not require testing for these contaminants.

Toxicity data are sparse for many synthetic organic chemicals. Previous standard-setting has focused primarily on cancer risks, but other risks such as hormone disruption or IQ depression may be more limiting.

A number of organic contaminants which are components of detergents are found in relatively high levels in sludges including linear alkylbenzene sulphonates (LAS), nonylphenol (NP), nonylphenol ethoxylates (NPE) and di-(2-ethylhexyl) phthalate (DEHP) (Giger, 1997). These vary in toxicity and degradability in the soil environment, but some are suspect regarding hormonal mimicking actions. To date, these contaminants have not been assessed by US EPA in regard to land application of sludges. Further research on their effects on humans and animals is needed (Krogmann, et al., 1997). Switzerland has banned the use of nonylphenol and a number of other countries have set standards for these constituents, as well as for total polycyclic aromatic hydrocarbons (PAHs), dioxins and for some measurement of total chlorinated organics. In Sweden, recommended limits for a number of organic contaminants were established in negotiations with the agricultural community. Maximum concentrations of 50 mg/kg for nonylphenol, 5 for toluene, 3 for PAHs and 0.42 for PCBs have been established (Matthews, 1996).

### Radioactivity

Radioactivity is not addressed in Part 503. Little is known about the extent to which sewage sludges are contaminated with radioactivity and monitoring is not required. While the average sludge may contain little radioactivity, individual sludges receiving waste water from various types of facilities may reconcentrate radioactivity in sludges (GAO, 1994). Further investigation is needed, particularly where potential sources discharge to sewage treatment plants including nuclear facilities, hospitals and other medical facilities and leachate from superfund sites containing radioactivity.

## 9. Ground and surface water calculations assume large dilution/attenuation

### Leachate diluted/attenuated before reaching well

While the US EPA risk assessment for the groundwater pathway (pathway 14, Table 3) states that the objective is to protect a shallow well immediately downgradient of a sludged field, the calculation assumes a large reduction of peak metal concentrations (through dilution and/or attenuation) by the time that leachate reaches a well (e.g., the reduction factor for arsenic is 244.) Depending on numerous characteristics of the site and contaminant, a well in the vicinity of sludged fields may not receive the benefit of that great a reduction.

Material balances on several sites which have received sludges show unexplained metal losses. Recent research indicates the potential for metals to leach from sludges and sludge products and the possibility of violating drinking water standards.

The generally-held belief that metals in sludges cannot readily leach has been called into question by recent data. Working with undisturbed soil columns rather than the repacked soil columns used in previous experiments, the potential for leaching of metals has been demonstrated. In undisturbed soils, channels created by worms and roots and other processes ("macropores") provide for rapid downward water movement that can limit the adsorption or chemical interactions between the percolate and the soil (Camobreco, et al., 1996). Transport appears to be governed by this fast and far-reaching preferential flow and by the relatively non-reactive forms of some of the metals, i.e., as soluble and/or colloidal complexes which is enhanced by the organic matter in sludges (Richards, et al., 1998). Most sludge research to date has overlooked this phenomenon. High pH (such as in alkaline-stabilized sludge products) can actually increase leaching since the solubility of some organically-complexed metals is high under such conditions. Examination of field research data collected over the years by many researchers shows that typically up to half of some metals applied in sludges appear to be "missing" from the soil and may have leached (Baveye, et al., 1999). Transport of a range of metals in percolating water has been directly observed at a field site where sludge was applied more than a decade earlier (Richards, et al., 1998).

Concentrations of Cd, Ni, and Zn exceeded drinking water standards in leachate collected from lysimeters immediately below soils receiving sludge 20 years after a large quantity of sludge had been applied to agricultural soils (Richards, et al, 1998). Calculations of impacts on groundwater indicate the potential for violation of drinking water standards in the vicinity of sludge application sites (Richards, 1997). Thus, the US EPA risk assessment assumptions may not be sufficiently protective of wells near sludge application sites. Further investigation is needed to ascertain if there is a significant concern for both metals and pathogens in groundwater, as viral pathogens could migrate by preferential flow as well.

### Only 0.24% of the model watershed receives sludge

There is concern for the quality of surface water in the vicinity of sludge application sites. There is potential for contaminants including metals and pathogens to be present in surface runoff and in

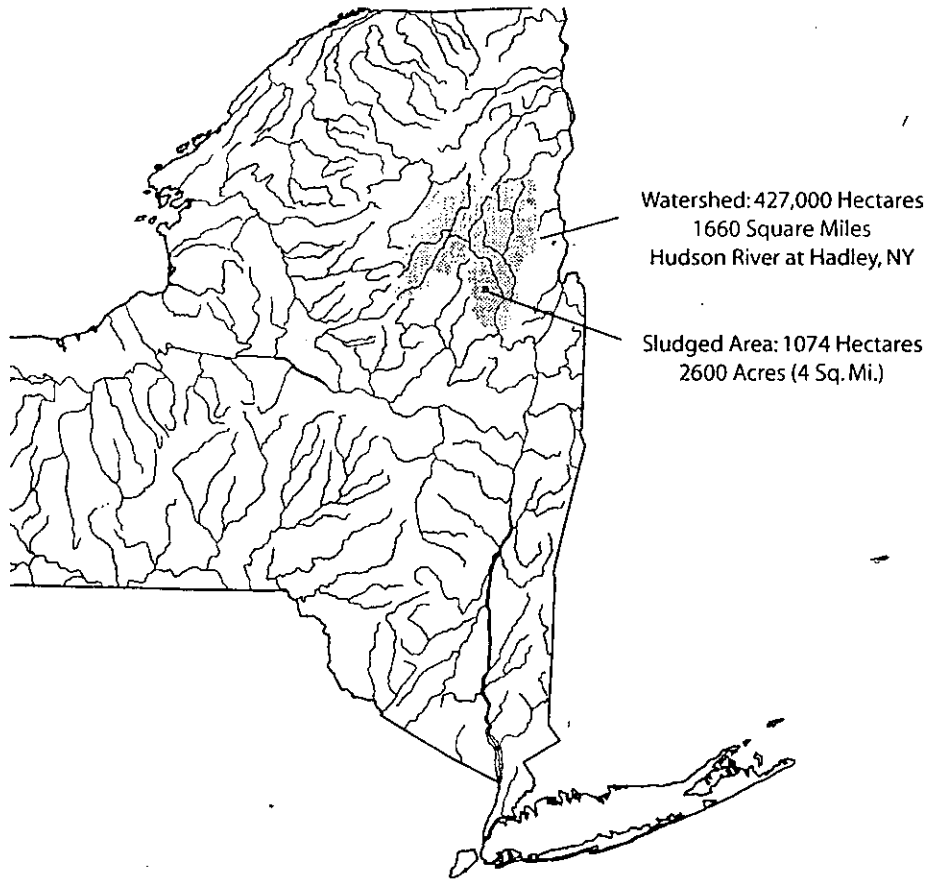



Figure 3. Map of New York Showing Example of Size of Drainage Basin And Proportion Receiving Sludges Under Part 503 Risk Assessment Assumptions

shallow percolating water that reaches tile drains which are common beneath fields in the northeast. The US EPA risk assessment used unrealistic assumptions regarding dilution of contaminants (Figure 3).

A key parameter in the surface water exposure pathway is the amount of the watershed which has received sludge. The Part 503 risk assessment assumes that only 1074 ha out of a 440,300 ha watershed receives sludge. This may be applicable to a very large watercourse, but in a local area a far greater proportion of a smaller stream's watershed may have received sludge. Figure 3 shows the size of such a drainage basin (in the upper Hudson River in NYS) and depicts the tiny fraction assumed to receive sludge applications. US EPA's choice is thus not protective of the smaller streams in agricultural areas where sludge is applied. For example, a change in the percentage of watershed area receiving sludge to assume a 100 acre farm receiving sludge in a 1000 acre watershed would lower calculated limits for PCBs by more than 95% as compared to the US EPA assumptions (Cleland, 1995).

Impacts of sludge application on surface water streams and lakes depend on the percentage of the watershed land that receives sludge.

In assuming that only a tiny fraction of the watershed is sludged, the Part 503 risk assessment fails to assess impacts on smaller bodies of water.

Recent laboratory and greenhouse research has shown that some metals present in sludges (Cu, Mo, Ni) are relatively soluble in the very alkaline product created by the mixing of sludge with cement kiln dust or fly ash, and lime. Much smaller fractions of a number of other metals (Ag, Cd, Hg, Pb

and Zn) were immediately water soluble (McBride, 1998b; Richards, et al., 1997). This solubility, likely a result of complexation with dissolved organic substances, suggests the potential for the movement of the soluble metals from land-applied alkaline sludge products into surface waters and shallow groundwater under some conditions. Further work is necessary to investigate field conditions. The sensitivity of aquatic organisms to dissolved copper suggests that a large dilution factor would be required to prevent toxicity in surface waters receiving runoff from areas where such sludge products have been surface applied (McBride, 1998b).

Sludges are applied to agricultural lands with a goal of increasing productivity through the addition of nutrients and organic matter. Excessive application of some contaminants, however, can reduce crop yields; risks vary among different soils and crops.

Since these pollutants do not degrade, it is critical to limit their addition to protect the long-term productivity of the land.

## 10. Not protective of agricultural productivity

### Phytotoxicity and crop yield reduction

Appropriate use of sludges on agricultural lands has positive effects on plant growth through the addition of nutrients and organic matter. Excessive accumulation of certain metals such as copper, zinc and nickel reduces crop yields. We need to assess not only short-term benefits, but long-term risks of yield reduction due to accumulation of contaminants over time. This pathway (Pathway 8, Table 3) was evaluated by US EPA in the risk assessment and has also been considered by agronomists at the land-grant universities in the northeast (Pennsylvania State University, 1985). The cumulative limits for copper, nickel and zinc in the Part 503 regulations are approximately ten times those recommended by the northeast soil scientists.

Acceptable cumulative levels of Zn and Ni depend on calculations of the uptake coefficients and of the yield reductions that are associated with the concentration of metals in the crop tissue resulting from uptake. As discussed above, the US EPA risk assessment used values for uptake coefficients that are not conservative. In addition, not all elements exhibiting phytotoxic impacts can be assessed with this plant uptake model. For Cu, for example, roots are affected by toxicity before tissue levels in the crop are elevated significantly. Assessing the risk of yield reduction based on uptake coefficients and tissue levels is not appropriate for such elements.

The yield reductions calculated in the EPA risk assessment are higher than most growers would find acceptable. For some growers, any reduction would be unacceptable. In one method, US EPA calculated the cumulative load of Zn allowed under Part 503 based on the probability that it could result in a 50% yield reduction. Although the US EPA calculations demonstrate a low probability of such a reduction, a standard based on such a calculation is not useful since such a high yield reduction is clearly unacceptable. Recalculation indicates that with a loading of approximately one tenth of the Zn standard in Part 503, yield reductions of 10% are likely in 10% of the soil-crop combinations in the US EPA database (Bouldin, 1997).

The Part 503 rules allow an accumulation of phytotoxic metals in soils that is about an order of magnitude higher than recommended by a panel of northeast soil scientists, or than the level which rules in Ontario and several European countries would allow.

Protecting agricultural productivity, especially in the northeast where soils are acid and sensitive crops such as beans or alfalfa are raised (Table 9), makes it prudent to restrict cumulative additions of phytotoxic metals (Table 11). Based in part on values derived by a group of northeastern soil scientists who recommend a sliding scale for phytotoxic metal loading limits according to soil texture, the

| Very Sensitive | Sensitive | Tolerant | Very Tolerant |
|---|---|---|---|
| Chard | Mustard | Cauliflower | Corn |
| Lettuce | Kale | Cucumber | Sudangrass |
| Beet | Spinach | Zucchini squash | Smooth bromegrass |
| Carrot | Broccoli | Oat | |
| Turnip | Radish | Orchardgrass | |
| Peanut | Tomato | Switchgrass | |
| Clovers | Birdsfoot trefoil | Kentucky Bluegrass | |
| Crownvetch | Soybean | Fescues | |
| Alfalfa[1] | Snapbean | | |
| Sunflower[2] | Timothy | | |
| | Bentgrasses | | |
| | Ryegrass | | |

Table 9. Relative Sensitivity of Crops to Sludge-Applied Copper, Nickel and Zinc[3]

[1] Hydroponic study (Ibekwe et al., 1996).
[2] Metal salts added to soil (Gorlach and Gambus, 1992).
[3] Adapted from Chaney and Hundemann in US EPA, 1992.

recommendations of this paper in Table 11 for copper, zinc and nickel are close to one-tenth of the Part 503 cumulative load standards (Pennsylvania State University, 1985). The recommendations in this paper also take into account soil metal levels known to cause toxicity to crops in specific field experiments (Table 10) as well as a reassessment of the US EPA data base on phytotoxicity applying more conservative assumptions.

### Soil microorganisms

Experiments at a number of long-term sludge-treated field sites in the UK, Germany, and Sweden, where metals had accumulated and persisted for decades, have shown that microbial functions in soils are adversely affected at metal concentrations that are not necessarily toxic to crops. Rhizobium populations in the soil can be reduced when the Zn, Cu, Ni, and Cd concentrations reach 130-200, 27-48, 11-15, and 0.8-1.0 mg/kg (ppm), respectively, in the soil (McGrath et al., 1995). Other microorganisms, such as free-living N-fixing heterotrophic bacteria and phototrophic cyanobacteria, are sensitive to heavy metals at these or even lower levels. The soil microbial mass is reduced at Zn, Cu, Ni, and Cd concentrations ranging from 180-857, 70-384, 22-35, and 0.7-6.0 mg/kg, respectively. Generally, higher soil pH and increased content of clay and organic matter in the soil mitigate toxicity, shifting the limiting concentrations toward the higher end of these ranges. Based on the negative effects observed in soil microbes, the advised limit in Great Britain for Zn in soils was adjusted downward from 300 to 200 mg/kg (UK Dept. of the Environment, 1995). The risk assessment for Part 503 does not set limits based on soil microorganisms (McGrath et al., 1994; US EPA, 1992).

### Animal health

Animals that graze on land to which sludge has been applied to the surface will ingest sludge along with the plants and some soil. Grazing cattle ingest from 1-18% of their dry matter intake as soil and sheep may ingest as much as 30% depending upon management and the seasonal supply of grass (Fries, 1996; Thornton and Abrahams, 1983). The US EPA risk assessment assumes a soil ingestion of 1.5% of diet. This is a non-conservative estimate based on use of best management practices. Incorporation of sludge into the soil can help prevent impacts to animal health, but it is very inconvenient so in practice sludge is generally applied to the surface in pasture land applications. US EPA regulations do not restrict grazing on lands to which Class A sludges have been applied and they allow grazing 30 days after application of Class B sludges. The adequacy of this one-month period for

| | Sludge-treated Mineral Soils | | Organic soils, pure Composts and Sludges | |
|---|---|---|---|---|
| COPPER | 100[1]<br>125[2] | protect most sensitive field crops | 1000-1500[3] | sludge pot study (oat, corn, spinach, etc.) |
| | 350[4] | toxic to rape field crop | 1100-1900[5] | compost pot study (cabbage, bean, chard, etc.) |
| | 500[6] | chlorosis in most crops | 2000[7] | peat pot studies (soybean, carrots, onion) |
| | 750 | EPA 503 | | |
| ZINC | 200-250[2,8] | protect most sensitive field crops | 1000[9] | field vegetables on muck |
| | 320[1] | ryegrass limit in pot study | | |
| | 360[10] | field bean yield loss | 2200[5] | compost pot study (cabbage, bean, chard, etc.) |
| | 390[11] | field oat, wheat yield loss | | |
| | 600-700[12,6] | field crop toxicity | 2000-3000[3] | sludge pot study (oat, corn, spinach, etc.) |
| | 1400 | EPA 503 | | |
| | 1500[1] | field grasses, cereals | | |
| NICKEL | 50[1] | red beet toxicity | 250-750[3] | sludge pot study (oat, corn, spinach, etc.) |
| | 200-220[1,11] | protect most field crops | 1500[13] | field vegetables on muck |
| | 210 | EPA 503 | 1800[7] | peat pot study (soybean) |

Values are soil concentrations in ppm (mg/kg)

Table 10: Phytotoxicity Thresholds For Crops Grown In Sludge-Amended Soils

[1] Sauerbeck & Styperek, 1986; Davis & Carlton-Smith, 1984
[2] Webber,1972
[3] Smilde, 1982
[4] Reith et al.,1979
[5] Handreck, 1994
[6] Rohde, 1962
[7] Roth et al., 1971; Levesque & Mathur, 1984
[8] Sanders et al., 1987
[9] Staker & Cummings, 1941
[10] Giordano et al., 1975
[11] Lubben et al., 1991
[12] Williams et al., 1985
[13] Frank et al., 1992; Temple & Bisessar, 1981

protection against pathogen transmission has been questioned, with an 18-month waiting period suggested (National Research Council, 1996). Denmark and Sweden do not allow application of sludges of any kind to lands used for grazing (Matthews, 1996).

Current limits for molybdenum (Mo) and selenium (Se) in Part 503 are also a concern. Both can be readily taken up by crops (high uptake coefficients) and can accumulate to concentration levels toxic to foraging animals. There is a narrow range between necessary nutrient levels and toxicity for these elements, and naturally occurring levels of these metals are highly variable within US soils. Molybdenum toxicity in ruminant animals (Mo-induced Cu deficiency) is associated with forages containing 10-20 mg/kg of Mo (or more) with relatively normal concentrations (4-10 mg/kg) of Cu in the forage (Kubota and Allaway, 1972). Molybdenum availability in soils is enhanced by moderate to high pH soil conditions, high phosphate fertilization, and high organic matter content (Fleming, 1980). Under such conditions, 2-3 mg/kg of total Mo in soil has produced forages with toxic concentrations for ruminants. Selenium toxicity in ruminants occurs if forages contain 5-10 mg Se/kg (Jacobs, 1989). Calcareous or alkaline soils with as little as 0.5-2.0 mg/kg of total Se can produce forages with Se at

toxic levels (Purves, 1985). Studies of uptake into red clover (McBride et al., in prep.) and forage grass (Nguyen and O'Connor, 1997) suggest that uptake is sufficiently high to call for limiting Mo additions to soils where forage is grown.

Application of sludges could pose some risk because sludge molybdenum and selenium are relatively soluble in sludges and are present at higher concentrations than in most soils. The high pH of alkaline-stabilized sludge products are conducive both to water solubility and to plant absorption of these elements. Most of the metal contaminant concerns regarding land application are related to long-term soil loading and thus are unlikely to result in impacts in the short term. In contrast, the potential for molybdenum toxicity can be an immediate concern. As with other calculations in the risk assessment upon which the Part 503 rules are based, the geometric mean of uptake coefficients from the very few studies of Mo uptake were used. This resulted in a cumulative limit of 18 kg Mo/ha which was subsequently deleted from the rules so that there is presently only a ceiling concentration limit of 75 ppm for Mo. The assumption that increased copper uptake resulting from sludge application would be adequate to offset the Mo taken up by the crops is not supported by research data (McBride et al, in prep; Webber et al., 1983). Uptake of Mo into legumes is relatively high, particularly from alkaline sludge products commonly used in NYS. Since a dairy herd may predominantly be fed on forage such as alfalfa (a legume) from a particular farm, protection of the health of ruminant livestock whose diet is forages grown on sludge-amended soils suggests that limiting soil concentrations of Mo to approximately 2mg/kg and limiting loading rates to 1-2 kg Mo/ha may be necessary (McBride, personal communication, 1998). In the U.K. a maximum soil concentration of 4 mg/kg is advised. However, elevated Mo levels in legumes may be associated with soils whose parent material contains 3mg/kg Mo or more (Kubota, 1980).

Iron, which can be high in sludges, can also cause toxicity in grazing animals by direct ingestion of sludge retained on forage. It is not one of the elements for which sludges must be tested or for which there are standards. Ingestion of soil is also an important and possibly even dominant pathway for lead and arsenic transfer into grazing animals (Thornton and Abrahams, 1983).

Animal health is sensitive to the ratios of different metals in their diets, so analysis of the various metals in both the sludge as well as other components of the animal diet needs to be conducted for the particular type of animal being raised. In addition, the potential impact of sludge application on wildlife grazing on sludge amended land is not well known (University of New Hampshire, 1998). There is some evidence that moose may be susceptible to molybdenosis (Frank, 1998).

Class B sludges contain significant pathogen levels.

Little is known about the leaching of pathogens to groundwater from sludge application sites.

## 11. Inadequate assessment of pathogen risks

Sludges contain a high concentration of pathogenic viruses, bacteria and parasites. In fact, most microbes which are present in raw sewage are concentrated in sludge. The levels and types are dependent in part on the health of the population contributing to the sewage plant and will vary over time as the health of the population varies. The type of sludge treatment also affects the viability of pathogens. High treatment temperatures (>56 degrees C) are relatively effective in killing pathogens.

Prior to land application, sludges must be treated to reduce pathogen levels. Class B sludges still contain significant levels of pathogens (Straub, et al., 1993). Class A sludges and sludge products have received higher levels of treatment (generally hotter for longer). If not killed, the small size of viruses and other pathogens may potentially permit them to leach to groundwater (Powelson, et al., 1991). This may be the most likely route of significant human exposure to pathogens from land applied Class B sludges (Straub, 1993). There is a need for field data regarding the movement of pathogens, particularly where groundwater is found at shallow depths and soils are conducive to preferential flow.

Few viruses have been studied in regard to sludges and unfortunately unlike viruses behave differently (Dubovi, 1997). No monitoring is currently required for viruses in sludges or sludge products.

Bacteria, unlike either viruses or parasites, can actually increase in numbers during treatment under certain conditions. Regrowth in composts that were not fully stabilized has been documented (Soares, et al., 1995). Thus a compost could have met processing requirements and standards for *E. coli* or *Salmonella* (US EPA requires testing for one or the other for Class A), but could subsequently have significant bacterial levels if regrowth occurs after testing.

Parasites such as Helminth ova are relatively resistant to inactivation when present as cysts. In Class B sludges they could be present in significant numbers and they have been documented to survive for many years in soils (Bowman, 1997). Little is known about the presence and viability of Cryptosporidium and Giardia in sludges. High levels of cysts of Giardia have been detected in sludges, but they may be inactivated (non-infective). More research is needed to assess the risks posed by these protozoa (Straub, et al., 1993).

Generally cooler, wetter conditions such as those found in the northeast favor survival of pathogens in the soil.

## 12. Ecological impacts inadequately assessed

The US EPA risk assessment addressed only the impact of copper on earthworms, and of cadmium, lead and PCBs on shrews using only field data from agricultural sites. Recognizing the limitations of this analysis, an US EPA-funded study has been carried out at Oak Ridge National Laboratory to assess the current state of knowledge on ecological impacts of sludge application. This study which examines impacts to plants and animals has not yet been released. Preliminary results indicate that for some contaminants, ecological risk may become the most limiting pathway. The standards for soil quality derived from the Dutch risk assessment found ecotoxicologic impacts to be the most sensitive measures requiring the lowest standards (van den Berg, et al., 1993; Crommentuijn, et al., 1994; Swartjes, 1997). The paucity of data on ecological effects used in developing Part 503 rules is likely an important reason why these rules are far less restrictive (McGrath, et al., 1994). The Part 503 rules will need to be reassessed when the results of the Oak Ridge study are available to determine what changes in contaminants levels may be needed to protect ecological systems.

Efforts to curb emissions of mercury are underway in NYS and elsewhere due to its toxicity and propensity to bioaccumulate. Recent research has demonstrated that some of the mercury in land applied sludge volatilizes and that the concentration of mercury in air over sludge sites contains 10-100 times the background concentration (Carpi and Lindberg, 1997). The EPA risk assessment assumes that no mercury is volatilized from land application. A review of the risk assessment in light of the new findings suggests that for most pathways there is not a substantial concern, but that the potential to impact local waterbodies through re-deposition of methyl mercury may be significant and warrants further analysis (Carpi, 1997). Worldwide sludge land application is estimated to emit to the air about one eighth of the amount of mercury discharged by power plants or by municipal waste incinerators (Carpi and Lindberg, 1997).

## 13. Inadequate enforcement and oversight

Enforcement (or the lack thereof) of rules and practices such as use of agricultural best management practices is a significant issue. This concern is magnified as both federal and state budget cuts force a reduction in environmental staff. US EPA has said that they view the 503 regulations as largely "self-implementing." Under the Part 503 regulations, sludge producers are required to follow processing procedures and perform monitoring. Periodic reporting is required, but no permits are issued for land

application (note that NYS currently requires site specific permits for Class B applications) and no record-keeping of application is required for Class A "EQ" sludges. Such a system gives neighbors of land application sites and others little confidence that rules will be followed. Without permits or records, there is no way for concerned parties to know even whether or not sludge products have been applied. It may also prove difficult for anyone to keep track of the cumulative load of metals applied from non-"EQ" sludges. Interestingly, even in Ontario where records were required, researchers found that they could not locate sludge application records because sludge haulers did not turn over records when contracts were transferred (OMAFRA, 1995).

Adherence to best management practices, some of which are specified in federal and state rules, is of critical importance in preventing negative impacts from sludge application. Further management practices may be recommended by agricultural advisors (e.g., Cornell Cooperative Extension, 1997). Without oversight there is concern that even required practices such as application at no higher than agronomic rates necessary to meet crop nutrient requirements or maintenance of setback distances from watercourses may not be followed, leading to water pollution.

In order to compare among sludges and sludge products, users need information on the product quality. Federal rules do not require suppliers to provide such information for sludges meeting "EQ" standards.

### 14. No labeling of sludges or sludge products

No labels nor information for users are required for sludge and sludge products which meet the EQ standards set in part 503. Thus information on the quality of the product is not readily available to potential users. Labeling is needed which includes analytic information about the concentration of contaminants and nutrients of the material. Growers and their advisors need the information to make appropriate decisions about nutrient management. Additionally, if those electing to use a sludge or sludge product want to select the cleanest possible material or to follow more stringent recommendations for application (such as those in Table 11), they require information on contaminant concentrations.

## Conclusions

US national standards for the land application of sewage sludges are markedly less stringent than those of many other countries. The standards were developed through an extensive risk assessment, but data gaps and non-protective policy choices result in regulations which are not adequately protective of human health and the environment.

The exposure pathways and significance of impacts for home use, agricultural use and other applications such as to golf course turf and roadside vegetation are significantly different. For home use, more stringent standards are appropriate, reflecting the greater likelihood of child ingestion of sludge and the potential for less careful management. For use on agricultural lands, reduction of soil productivity and animal health concerns are of greater significance. For many other uses, these pathways are of less importance, which might result in less stringent standards.

The application of sewage sludges to agricultural lands and home grounds should be based on acceptable resultant contaminant concentrations in the receiving soil. Where a single set of standards are applied regardless of end use, the limits should reflect the most limiting pathway. Table 11 suggests maximum soil concentrations appropriate for soils in the northeastern US. The numbers are for recommended maximum soil concentrations and reaching these levels will depend on initial soil concentrations, the concentration of the contaminant in the sludge, the total loading of sludge applied and any losses (e.g. through leaching). Limiting application to these maximum levels will also help prevent excessive contamination with currently unregulated contaminants by limiting the amount of sludge that could be applied over time. Sludges with contaminant concentrations not exceeding the

levels in ppm listed for maximum soil concentrations in Table 11 could be applied in unlimited cumulative quantity without exceeding the recommended soil concentrations for contaminants. (Application at appropriate annual rates to ensure that nutrient levels are not exceeded is still required.) For sludges exceeding the Table 11 recommended maximum concentrations, calculations should be made to determine the cumulative amount of sludge which could be applied without exceeding the recommended soil concentration.

In addition to testing of receiving soils, monitoring for a number of currently unregulated contaminants should be required and test results provided to potential users to enable them to compare among different sludges. Tests should include synthetic organic chemicals (including dioxins and furans), antimony, beryllium, boron, chromium, and silver. If animals will be grazing or if forage is grown, copper, fluoride, iron, molybdenum and selenium should be monitored and dietary metal ratios considered.

Further research is needed on nitrogen release rates, the movement of metals and pathogens to ground and surface water, the presence and impact of synthetic organic contaminants and of contaminants eliminated from US EPA Round 2 consideration due to inadequate data, and ecological impacts (including soil organisms). Additional standards should be developed to address the research findings.

Policies should be designed to support pollution prevention and promote continued improvement in sludge quality. This includes establishing outreach and technical assistance programs, as well as regulations which minimize the use of undesirable contaminants, especially those which are persistent in the environment. "Clean sludge" standards should be set at levels low enough to motivate minimization of pollutant concentrations.

## Recommendations Regarding Application of Sewage Sludges on Agricultural Lands or Gardens

### Recommendations to those who elect to use sewage sludges or sludge products

#### Sludge and soil quality

1. Limit application of sludges so that the soil concentrations in Table 11 (last column) are not exceeded. The numbers are for recommended maximum soil concentrations. Reaching these levels will depend on initial soil concentrations, the concentration of the contaminant in the sludge, the total loading of sludge applied and any losses (e.g. through leaching). Limiting application to these maximum levels will also help prevent excessive contamination with currently unregulated contaminants by limiting the amount of sludge that could be applied over time. Table 11 For sludges exceeding the Table 11 recommended maximum concentrations, calculations should be made to determine the cumulative amount of sludge which could be applied without exceeding the recommended soil concentration.[1] Sludges with contaminant concentrations at or below the levels listed for maximum soil concentrations in Table 11 could be applied in unlimited cumulative quantity without exceeding the recommended soil concentrations for contaminants. (Application at appropriate annual rates to ensure that nutrient levels are not exceeded is still required.)

[1] To determine the total number of tons/acre which could be applied for a sludge with measured contaminant levels apply the following equation: Total cumulative application in tons/acre=1000 x (max. soil concentration in ppm minus background soils concentration in ppm) divided by sludge contaminant concentration in ppm. For example: If a sludge contains Cd at 10 ppm, background soil is 0.2 ppm, and the recommended maximum soil concentration of 2 ppm is used, a total of 180 tons/acre could be applied [1000x(2 ppm - 0.2 ppm)/10 ppm] without exceeding the recommended maximum soil concentration, assuming all of the cadmium applied remained in the soil.home (Texas Natural Resources Commission, 1996). Background soil often exceeds 1 ppm so a range suggested as potentially acceptable.

| Contaminant | Typical NYS Sludge Conc.[1] | Typical NYS Agr. Soil | Recommended Soil Maximum Concentration |
|---|---|---|---|
| Arsenic | 3-10 | <9 | 1-10[2] |
| Cadmium | 2-15 | 0.2 | 2[3] |
| Chromium | 50-500 | 52 | —[4] |
| Copper | 300-1500 | 20 | 40-100[5] |
| Lead | 100-300 | 15 | —[6] |
| Mercury | 1-10 | 0.1 | 1[7] |
| Molybdenum | 5-50 | 1.0 | 4[8] |
| Nickel | 10-150 | 16 | 25-50[9] |
| Selenium | 2-6 | 0.4 | 5[10] |
| Zinc | 500-2500 | 60 | 75-200[11] |
| PCBs | <5 | | 1[12] |

Values are in ppm dry weight. 1 ppm ≈ 2 lbs./acre cumulative load.

Table 11. Maximum Concentrations of Contaminants in Soils

[1] Based on a survey of NYS sludges (NYS DEC, 1994).
[2] Risk assessment based on child ingestion and 0.0003 RfD suggests 1 ppm concentration limit for sludges used at home (Texas Natural Resources Commission, 1996). Background soil often exceeds 1 ppm so a range suggested as potentially acceptable.
[3] A limit of 2 ppm is recommended due to crop uptake concerns.
[4] The chemical form of chromium is of critical importance. Cr III is of little concern because it forms relatively insoluble compounds, while Cr VI is highly toxic and soluble. Little information is available on the ionic status of Cr in sludged soils and the potential for chromium oxidation in sludged soils.
[5] Concentration limit to prevent phytotoxicity based on the northeast guidelines (Pennsylvania State, 1985). 40 ppm for sandy soils, 60 ppm for fine sandy loam to silt loam, 100 ppm for silt to clay soils.
[6] The lowest attainable levels are desirable since negative human impacts continue to be discovered at increasingly low levels. Child ingestion is the primary concern.
[7] The lowest attainable levels are desirable. Ecotoxicologic and groundwater impacts are likely to be the determining factor.
[8] Excessive molybdenum can result in molybdenum toxicity (induced copper deficiency) in ruminants. A minimum dietary Cu:Mo ratio of 2:1 is advised. Testing forages for molybdenum and copper periodically and preventing ruminants from grazing on land to which sludge has been applied and not incorporated into the soil is recommended.
[9] Concentration limit to prevent phytotoxicity based on the northeast guidelines (Pennsylvania State, 1985). 25 ppm for sandy soils, 35 ppm for fine sandy loam to silt loam, 50 ppm for silt to clay soils.
[10] This may be high. Test forages periodically for selenium to assure that concentration does not exceed that considered toxic to animals.
[11] Concentration limit to prevent phytotoxicity based on the northeast guidelines (Pennsylvania State, 1985). 75 ppm for sandy soils, 130 ppm for fine sandy loam to silt loam, 200 ppm for silt to clay soils. Higher concentrations can be tolerated in calcareous soils.
[12] Based on EPA recommended soil levels (US EPA, 1990).

2. As a general precaution, do not land-apply at high rates or for many applications any sludge with contaminant concentrations greater than those listed as recommended maximum soil concentrations in Table 11.
3. Excessive application of nutrients resulting in leaching of nitrogen and excess enrichment of phosphorus in soils may result from sludge application, particularly on livestock farms where there may already be excess nutrients. Therefore apply only according to a nutrient management plan.
4. Obtain information from supplier (and applicator if sludge is spread by another party) which states that the sludge meets all required standards and that required application practices have been followed. Indemnification can also include a commitment to provide legal defense on behalf of the farmer should a lawsuit be brought.

**Testing**

5. Require the supplier to provide information on content of contaminants. Consumers including farmers should be able to compare among various products to select the one with the lowest contaminant levels and optimal nutrient content. In addition to the regulated contaminants, request information about synthetic organic chemicals (including dioxins and furans), antimony, beryllium, boron, chromium, and silver. If animals will be grazing or if growing forage, also request analyses for fluoride, iron, molybdenum and selenium and consider dietary metal ratios. Ideally the tests would pertain to the specific load of sludge or product being used (not a report from several years ago). When this is not possible, reports from several different sampling times should be compared to ensure that levels are relatively constant. Select only products with consistently low levels of contaminants.
6. Test soils before application to determine pH, nutrient requirements and metals concentrations. Avoid over-application of metals by testing for background levels before application and at least every five years in a sustained application program.
7. Test shallow water supply wells that are near and downgradient of field where sludges have been applied for metals and pathogens.

Note: In NYS, soil analyses for some constituents may be obtained through Cornell Cooperative Extension. Contact the Dept. of Health or DEC for information on other laboratories certified to perform analyses.

**Uses and Management Practices**

8. Caution is advised regarding application of sewage on land used for forage production or grazing. Toxicities can result from imbalances in trace elements, particularly molybdenum, selenium and copper. For Class B sludges, pathogens are a concern. If sludge or sludge products are used, do not apply to standing forage. If used, incorporation into soils is particularly important and analysis of the ratio of various metals in the animal diet is recommended.
9. Apply as you would manure, using a calibrated spreader to ensure accurate, uniform distribution. Prevent over application and avoid hotspots. If someone else is applying, make sure they spread properly. Visit fields where they have previously applied.
10. Maintain soil pH at 6.5-7.0 to minimize plant uptake and leaching unless contaminant levels are low, similar to background soil concentrations or recommended soil values in Table 11.
11. Incorporation is recommended to prevent odor problems, enrichment of surface water runoff and deposition of dust or spray on crops. Spread sludges within one or two days of delivery and incorporate within 48 hours after application. Assume odors will always be a concern for neighbors when using sludges.
12. Maintain setbacks from streams, ponds, wells and property lines.
13. Avoid application on steep slopes, on saturated soils where runoff is excessive, or on shallow or extremely well-drained (coarse) soils where percolation to groundwater may be rapid.
14. Avoid contact with and inhalation of Class B sludges to reduce pathogen hazards.
15. Take delivery only after analytical reports have been examined, application plans have been understood and agreed to, and best management practices established.
16. Check with NYS DEC, farm credit organization and person buying crops to determine any restrictions.
17. Avoid access to sludge products by children. (Home garden use presents the greatest potential for child exposure.)
18. Avoid use on home vegetable gardens (currently NYS regulations specify such a restriction and require distributors to include such a restriction on the label or distribution information). Concerns about cadmium and synthetic organics are the primary reason for the recommendation. If a resident decides to use a sludge product, use one with low contaminant levels (preferably meeting the recommended soil concentrations in the last column of Table 11).

### Suggestions for policies and regulations

The following suggestions are based on a review of the US EPA Part 503 regulations in light of current research. NYS DEC regulations presently address some of these issues. The authors and other Cornell faculty and staff would be pleased to discuss these recommendations and assist in developing them into policies which can be implemented.

#### General

1. Reevaluate policy and regulation for application of sludges to land in light of the inadequacies in the Part 503 risk assessment.
2. Reevaluate and revise regulations to reflect the results of the US EPA supported study being conducted at Oak Ridge National Laboratories regarding ecological impacts of sludge application when these are available.
3. Consider adoption of maximum soil concentrations for contaminants (see Table 11 for recommended limits).
4. Consider the adoption of standards for "clean sludge" that are at least as restrictive as the values in the last column of Table 11. Any sludge product for which tracking of cumulative additions is not required should meet these values. For tracked products, include a ceiling limit (for NYS, the 95th percentile values for NYS sludges would seem a reasonable ceiling) and require a calculation of and limit application to the number of tons which could be applied before reaching the recommended maximum soil concentrations in Table 11.
5. Consider regulating home use, agricultural use and other applications such as to golf course turf and roadside vegetation differently since exposure pathways and significance of impacts are very different. For home use, more stringent standards are appropriate, reflecting the greater likelihood of child ingestion of sludge and the potential for less careful management. For use on agricultural lands, phytotoxicity concerns are of greater significance. For many other uses, these pathways are of less import which might result in less stringent standards.
6. Work to develop standards for PCBs, dioxins and other organics such as detergent constituents.
7. Work to develop standards for other elements reviewed in Round 2 by US EPA.
8. Consider measures to apply equal controls to sludge products imported from out of state.

#### Monitoring and Labeling

9. Consider implementation of labeling requirements for sludges and sludge products that include information on the source of the materials, the content of contaminants and on required and recommended management practices.
10. Require testing for synthetic organics, including surfactants, and additional metals. Testing for organics might be required when a permit for beneficial use of sludge is requested and periodically thereafter, with frequency depending on the size of the plant and whether or not it accepts industrial waste waters. In addition to the regulated metals, particular attention should be paid to antimony, beryllium, chromium, silver; and, if animals will be grazing or forage grown, also fluoride, iron, molybdenum and selenium.
11. Consider expanding pathogen testing to include both fecal coliform and salmonella and require non-detection of salmonella for Class A sludge.
12. Consider development of groundwater monitoring requirements, taking spatial, temporal and analytic issues into account.
13. Consider requiring posting of sites where sludges have been applied and require information for farmworkers on the potential hazards of exposure and how they can be minimized.
14. Review existing data on use and disposal of radionuclides and assess potential exposures and require monitoring of sludges for radioactivity.

**Home Use**

15. Eliminate the Alternative Pollutant Loading Rate approach. Research shows that it is unreasonable to expect all home users to abide by restrictions printed on a label. It also potentially exposes children to materials which, if ingested, might represent an unacceptable risk.
16. Consider requiring any product available for home use to meet maximum concentrations listed in the last column of Table 11 (in addition to pathogen control and labeling requirements).

**Compliance and Permitting**

17. Consider stringent criteria for allowing surface application of Class B sludges based on strict necessity and an assessment of ecological and animal health impacts.
18. Support a strong compliance program including monitoring of sites, evaluation of compliance with management requirements and investigation of complaints.

**Research and Pollution Prevention**

19. Support research on nitrogen release rates, the movement of metals and pathogens to ground and surface water, the presence and impact of synthetic organic contaminants and of contaminants eliminated from Round 2 consideration due to inadequate data, and ecological impacts (including soil organisms). Some of this research needs to be northeast-based where soil conditions are more conducive to contaminant migration to groundwater and soil and crop types render crops more susceptible to phytotoxicity. Other topics can be investigated more generally.
20. Support pollution prevention through research, education, outreach, and technical assistance to promote continued improvement in sludge quality. NYS should establish pollution prevention vs. end-of-pipe pretreatment programs for businesses, local municipalities and trade organizations which might be linked to existing pretreatment.
21. Consider a fee on sludge generation as a partial funding source for necessary research, compliance programs and pollution prevention assistance.

**Recommendations for home gardeners who have already applied sludge products**

1. If possible, obtain test results from the supplier for the sludge product used and compare these with the recommendations in Table 11. If such data cannot be obtained, consider paying for an analysis. Your local cooperative extension may be able to advise you about obtaining a sample and getting an analysis for some of the contaminants. For other contaminants, the local or state health department may be able to provide a list of laboratories.
2. If a lot of sludge has been applied (for example if sludge products comprise 25% or more of the top six inches of the garden soil), spread out to dilute or remove. Mix what remains thoroughly and deeply into soil. Dilute it with topsoil or relatively clean organic matter such as leaf compost.
3. If sludge products have been used in vegetable gardens, consider converting these to ornamental gardens, lawn or ground cover. Establish a new vegetable garden on non-sludge amended soils. (Note that in NYS current regulations prohibit use of sludge or sludge products on crops for direct human consumption such as home vegetable gardens. Enforcement of this provision is through required labeling of products available to home users.)
4. Test soil for cadmium and lead. If higher than 2 ppm cadmium, either further dilute with clean soil or avoid growing leafy vegetables. If you wish to be very cautious, prevent access by small children who might ingest soil where lead exceeds 150 ppm.
5. In general, it is recommended to prevent access to sludged areas by small children who might ingest sludged soils to avoid potential exposure to pathogens (possibly an issue with composted sludges) and other contaminants.
6. In ornamental gardens, incorporate sludge products into the soil or if not possible, cover the soil where sludge has been applied with a thick layer of appropriate mulch to reduce the chances of a child ingesting the sludge and replace the mulch as needed.
7. If used where vegetables are grown, keep pH adjusted to approximately 6.5-7 to reduce uptake of lead and cadmium by plants.

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CORNELL WASTE MANAGEMENT INSTITUTE
100 Rice Hall Cornell University Ithaca, NY 14853

## Who Are We?

The Cornell Waste Management Institute (CWMI) was established in 1987. CWMI addresses the environmental and social issues associated with waste management by focusing University resources and capabilities on this pressing economic, environmental, and political issue. Through research, outreach, and teaching activities, CWMI staff and affiliated researchers and educators work to develop technical solutions to waste management problems and to address broader issues of waste generation and composition, waste reduction, risk management, environmental equity, and public decision-making. The focus for such work is on multi-disciplinary projects that integrate research and outreach. Working in collaboration with Cornell faculty and students from many departments and with cooperators in both the public and private sectors, issues ranging from management of sewage sludges to enviroshopping are the focus of on-going programs.

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30 March 1999

Natural Resource Committee Members
115 State House Station
Augusta, Maine 04333-0115

Dear Sirs/Madams:

I understand that you are considering legislation concerning regulations on the use of sewage sludge. For several years, I investigated the potential of sewage sludge for use on agricultural land for crop production. My graduate students and I used sludge form Syracuse, NY (contaminated sludge) and Cayuga Heights, NY (uncontaminated sludge from a residential area with only one tiny industry).

We grew crops in both sludge types and assessed the growth of the crops and abundance of beneficial and pest insects on the sewage treated crops. In the first experiments, we found that insect populations were significantly reduced on the Syracuse sludge, similar to as if it has been treated with a systemic insecticide. In the first experiment, the crops and insects did well on the Cayuga Heights sludge.

However, subsequent experiments using sludge from the same locations, we found the crops and insects responded similar to the first experiments. What was unexpected was that the crop plants did poorly and the insects were negatively influenced by some unknown chemical(s) in the Cayuga Heights sludge. We consulted a toxicologist but did not have sufficient funds to conduct an investigation of the chemical pollutants that were NOT supposed to be in Cayuga Heights sludge. This illustrates the problem with sludges -- one batch may be alright for agricultural use but the next may not be. Needless to say we never ate any of the crops produced on fields with either the Syracuse sludge or the Cayuga Heights sludge.

We also fed earthworms on Syracuse sludge and then fed Japanese quail the contaminated earthworms. We found that the earthworms concentrated one of the heavy metals, cadmium. This metal was found to be toxic to the quail. It is quite possible that this and other heavy metals commonly found in sludge will be toxic to other bird species that feed on contaminated earthworms.

Sludge also may contain metals from city water. For instance, we found that we could not use the water from Cayuga Heights to raise some snails because of the copper in the tap water. More than 99% of the water pipes in Cayuga Heights have copper piping. Copper is leached from the pipes at sufficient levels to be toxic

to some snails that are highly sensitive to copper. Of course, the copper will accumulate in the soil and eventually be toxic to crops and other plants.

The hazards of using sludge is that the toxicants may be tolerable in one batch of sludge but not in another. In addition, chemicals like copper in time will accumulate in the soil and be toxic to crops and plants. Once the metals contaminate the soil, it is impossible to cleanse the soil of the pollutants.

Although sludge might be viewed as a beneficial resource with valuable nutrients, the risks of applying the sludge to agricultural lands has too many risks for the available benefits.

I hope that my scientific research and experiences with sewage sludge is of help to you.

Sincerely yours,

David Pimentel
Professor of Ecology and Agricultural Sciences

cc Mr. Richard Richardson

(Report issued January 1999 by Ministry of Environment, Ontario, Canada)

# REVIEW OF ATLANTIC PACKAGING SLUDGE

**NB: The Ministry of Environment is receiving responses to the Investigation Report on Atlantic Packaging sludge until January 20th.**

## Introduction

The Atlantic Packaging "Soil Enrichment Program" is an experimental program managed by the Ontario Ministry of the Environment that allows the waste sludge from the Atlantic Packaging mills in Scarborough and Whitby to applied on farmland as a "soil conditioner". When this program started in 1993, the Ministry was relatively confident that some agricultural benefits could be derived from applying sludge, but had no scientific evidence that long term application would be a benefit. The Ministry required that the mill conduct a 5 year long "Soil Benefit Study" as one of the conditions of operating the program.

## Problems Emerged Early On

After the first year of the program, Gardner Lee, the independent research company hired to evaluate the program, found there there was no benefit in yield from applying sludge. They recommended more comprehensive tests and were fired by the proponents. The Atlantic Packaging Biosolids Manager was then hired as the "independent" research consultant. For several years, the research on land application became increasingly sketchy as farms were withdrawn as test sites due to excessive or uneven spreading, and control fields were spread with sludge.

At the end of five years, when the "Soil Benefit Study" was to be provided to the Ministry of the Environment, there was little scientifically valid information on which the Ministry could make a program decision. The company had not met their obligation to demonstrate benefit from the program. Therefore the Ministry requested an investigation from the Phytotoxicology Section of the Standards Development Branch. Last week the Ministry released the results.

## Phytotoxicology Investigation and Audit

The Ministry audited the contaminant levels in Atlantic sludge by requesting a sample, which it then split with the company. The Ministry and the proponent each tested the same sample. Oddly enough, the Ministry laboratory reported much higher levels of contaminants than the company. Some contaminants, like dioxins, measured more than 10 times the levels reported by the company.

## Problems with Plant Growth and Yeild

The Ministry investigation grew a variety of plants in pots of sludge. Ministry tested the results of plant growth and yield at various rates of sludge with and without supplemental nitrogen. The results were informative.

Plants that are sensitive to nitrogen, such as spring wheat and tomatoes, did badly when grown in sludge. Their growth and yield were dramatically reduced as the amounts of sludge in the pots increased. Even when supplemental nitrogen was added, growth and yield was not as good as that of plants grown without sludge.

Soybeans were also tested. The Ministry speculates that since soybeans are a legume and fix nitrogen in the soil, they are less nitrogen sensitive, and the results of sludge application were less detrimental. It is impossible to draw conclusions about the long term effects of sludge on

soybeans from a one year study.

**Earthworm Mortality**

The Ministry did not complete the earthworm reproductive testing as outlined in Ministry protocol. The experiments are incomplete. However there was a significant die off of earthworms (17 to 34%) when small amounts (1.5%) of Atlantic sludge was added to the soil matrix. This was interesting because the earthworms had a high survival rate in high concentrations of sludge. More tests need to be done to determine the reasons for the high die off rate at low rates of sludge.

**Implications for Farmers**

Farms that applied Atlantic Packaging sludge may have degraded the quality of their soil, and farmers may well have experience crop loss due to use of Atlantic sludge on wheat or corn or other nitrogen sensitive crops. Farm may require assistance in soil rehabilitation, and farmers may want compensation for losses.

**No Soil Enrichment**

It is clear that there is no "soil enrichment" in the "Soil Enrichment Program". Even the one year test on soybeans does not provide answers as to whether these results are sustainable. There is no evidence of how long soil detriment lasts once fields have been spread with sludge.

Therefore the Ministry of the Environment should not renew the Certificate of Approval for the Atlantic Packaging Soil Enrichment Program.

**Summary Conclusions**

1. There is no demonstrated soil benefit provided by Atlantic Packaging (a legal requirement)

2. Ministry Toxicology study demonstrates significantly reduced yeild in nitrogen sensitive crops

3. The public has opposed the program which was dogged with over 1200 pages of complaints

4. The proponent failed to provide before and after audit sampling on farms in the program.

5. For 5 years the sludge contained nonylphenol: an endocrine disruptor Other chemicals, or combinations of chemicals in the sludge could cause environmental problems as well.

6. Townships that participated in the program have concerns that farm application of sludge may be contributing to health problems like asthma, are adding dioxins to the soil, may be contaminating soil and groundwater underneath storage piles. Some townships have already stated that the program should not be renewed in their township.

7. The Ministry of the Environment does not have enough time, resources, or staff to manage the program. Cattle and other animals are exposed to sludge, and the Ministry has not tested the impact of these wastes on animals, nor does the Government of Ontario currently have the tools to enforce the Guidelines in this regard.

8. Government of Ontario policies on the land application of wastes is clearly more permissive than is warranted by the scientific evidence available. Widespread programs that allow waste application on farmland, like the Standard Approval for sewage sludge, should be curbed until

there is a clear body of scientific evidence to study the consequences.

9. Farmfields that have been spread with Atlantic Packing sludge may require rehabilitation. This should be investigated immediately.

10. There should be no renewed Certificate for the land application of Atlantic Packaging paper sludge.

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# Toxic Avengers

## The EPA is pushing hazardous sludge as fertilizer. The locals are fighting back.

**By Laura Orlando**

*This article was published in the February 21, 1999 issue of In These Times magazine.*

It all started with the Clean Water Act. In 1972, the federal government decided to get tough by regulating waste discharged from municipal sewage treatment plants. Because every plant in the United States had a pipeline dumping noxious waste into a body of water, Congress mandates and funded upgraded treatment processes. Improving treatment meant cleaner wastewater at the end of the pipe, but it elevated the level of contaminants in the dregs of the process--the mud-like toxic waste called sludge. Between 1972 and 1987, $60 billion was spent by municipalities to build and upgrade treatment plants, which now produce about 8 million dry tons of sludge annually.

Sewage is a mixture of whatever is flushed down toilets, runs off roads, is disposed of by industries and enters one of the nation's 16,000 publicly owned treatment plants. After treatment, the liquid component, wastewater, is discharged into the nearest body of water. Sludge, the semisolid residual, is everything leftover, including an unpredictable mix of heavy metals, synthetic chemicals, radioactive waste, medicines, and so on.

For years, most cities on the coasts simply dumped their sludge into the ocean. This practice ended after garbage and syringes washed up on New York and New Jersey beaches in the summer of 1987. Contrary to public perception, the garbage had nothing to do with sludge dumping from barges 12 miles from the shore, but lawmakers swiftly responded to pressure from environmentalists with the Ocean Dumping Ban Act, which outlawed the transportation and dumping of sludge into the ocean after 1991. New York and New Jersey, however, still needed a place to put the 11 million wet tons of sludge they were dumping each year.

Enter the Environmental Protection Agency: A year after ocean dumping was banned, the EPA rewrote the rules governing disposal of sewage sludge, reclassifying the noxious stuff from a hazardous material to a "safe" fertilizer. Sludge also underwent a linguistic detoxification and marketing makeover--sludge became "biosolids" and disposal became "beneficial use." by 1993, the EPA had formulated the National Biosolids Management Program to promote sewage sludge as fertilizer. Now, more than 2.5 million tons of sludge are being spread on land each year.

The EPA regulates only 21 of the countless pollutants in sludge, leaving thousands of contaminants, like dioxin and PCBs, unregulated and headed for gardens and farmland. Even the notion that sludge is a useful fertilizer--as a source of nitrogen--is phony. In the billions of gallons of wastewater and mounds of sludge, there is human excreta and, in that, nitrogen. But only tertiary (or advanced) treatment--used by less than a third of U.S. treatment plants--has the capacity to remove nitrogen from wastewater and put it in sludge. And the more thorough the treatment process, the more toxic the sludge. "The EPA required the petroleum and automotive industries to change the way they do business and to decrease the amount of environmental lead pollution that was occurring due to lead and gasoline," says Stanley Tackett, an expert on the effects of lead in the environment. "It's ironic now that one application of sewage sludge to a field puts more lead in the soil than did the 60 years of driving by the field with leaded gasoline."

The waste management industry profits handsomely from the EPA's sludge-as-fertilizer ruse. These "refuse collectors" are hired by treatment plants to haul and spread sludge. Between 1992 and 2002, New York City alone expects to spend more than $2.5 billion on sludge management programs. A large part of this money will go to contractors like Browning-Ferris Industries and WMX Technologies, which haul hundreds of tons of sludge because they are hoodwinked into thinking it's a good fertilizer. They get it for free or at a nominal charge, with treatment plants paying for its transportation, application, and the necessary monitoring and record-keeping. Some farmers are even paid to take it. Once spread, however, all liability for putting the poison on the land transfers to the landowner.

As the horror stories mount--such as Vermont dairy farmer Robert Ruane's who watched his cows die from eating sludge-contaminated soil and feed--word is getting out that toxic sludge is incompatible with agriculture. At the local

level, people are challenging the EPA's sludge disposal policies. "The sludge industry says they have to comply with strict state and federal rules," says Helane Shields of the anti-sludge group Citizens For Future New Hampshire. "Let's consider this analogy: A state trooper pulls you over and tells you, 'You have to comply with strict speed limits,' then tells you to go on your way and don't go any faster than 170 miles per hour. That is exactly what is happening with EPA and New Hampshire sludge rules."

New Hampshire produces about 24,000 tons of sludge each year. But the state's "open-door policy" allows the import of sludge from states like Massachusetts with stricter environmental regulations. Half of the sewage sludge being dumped in New Hampshire is coming from out of state. Shields says that without federal or state regulations, "the only way you can protect yourself is by enacting local ordinances or bans."

Local control is the big issue facing sludge opponents across the country. In New Hampshire, 44 towns have stopped or restricted sludge spreading through various local mechanisms. In neighboring Vermont, where 40 percent of the state's sludge is spread on land, getting local control over sludge processing and disposal has been a rallying point for groups such as Rural Vermont and East Montpelier's Citizens for Clean Compost. In East Montpelier, residents voted overwhelmingly to stop construction of a sludge composting plant. The nonbinding vote--taken by the city government to gauge public opinion--was ignored by city officials. But residents have managed to tie up the permitting process, temporarily halting construction. The Clean Land Campaign was formed in July 1998 to help push responsible sludge legislation--such as giving towns the right to a binding vote on sludge composting facilities--through the Vermont legislature.

California, where 1.8 million tons of sludge is dumped on farmland each year, has the best record for turning the sludge haulers away. County by county, Californians have exerted control over the spreading of sludge, and have gotten local bans and ordinances that put restrictions on its disposal. Three counties--San Bernardino, Stanislaus and San Joaquin--have banned it outright.

Another promising strategy is the tracking of sludge applications. Such disclosure will not only make farmers think twice before accepting sludge and alert opponents to its whereabouts, but may also influence the future value of the land. "When pesticides are used in California, a permit is filed

in the agricultural commissioner's office and an application report is completed by the supplier," says Jane Beswick, a dairy farmer and coordinator of the Coalition for Sludge Education. "The parcel is therefore tagged and anyone interested can find out who has used what pesticide where. Tagging the parcel when sludge is spread would make it possible for any future purchaser or tenant to know whether sludge has ever been used." In San Luis Obispo County, David Broadwater learned about a plan by Bio Gro, one of the 530 subsidiaries of WMX Technologies, to spread 17,000 tons of sludge annually on local ranches. Taking Bio Gro by surprise, Broadwater lobbied the regional water board to require an Environmental Impact Report for the project. Bio Gro decided not to pursue the report, stopping the dumping.

Of course, turning back the sludge trucks is just the first step. Unless sludge is treated with the precautions and regulations other hazardous wastes now receive, polluters will always find another field. The EPA's sludge disposal policy must be changed if this serious form of pollution us to stop being shuffled from county to county and from industry to the public. "The EPA is putting pressure on the state to control local folks," Broadwater warns, "A big steamroller is coming."

SIDEBAR
Radioactive sludge

Adrienne Anderson says that the Environmental Protection Agency's reclassification of sludge as a safe fertilizer has created a loophole "large enough to drive nuclear weapons waste dump trucks through."

Anderson was one of only two members of Denver's Metro Waste Water Reclamation District board to oppose an EPA plan to take radioactive groundwater from the Lowry Landfill Superfund site in nearby Arapahoe County, run it through a pipeline to Denver municipal waste treatment system and spread the resulting radioactive sludge on a city-owned 41,000-acre farm just outside of town. Lowry was the dumping ground for other Colorado Superfund sites, and it includes hazardous waste from the Rocky Mountain Arsenal, which produced nerve gas, Martin Marietta's Titan Missile program and Coors' nuclear fuel rod making days. The pipeline is a convenient way to transfer liability to the public and rid the Department of Energy of a nasty problem.

The EPA has approved the disposal of wastewater from 32 other Superfund sites into municipal sewer systems across the country, but Lowry is the only one known to contain

plutonium. The EPA and DOE continue to deny that the plutonium contamination at Lowry is out of the ordinary. Indeed, an EPA contractor at the Lowry site, CH2M Hill, attributed plutonium readings to "cosmic dust falling from space." Yet Anderson has found an index of 8,800 secret government documents related to Lowry. The listing, mostly blacked out because of claims of national security, demonstrates that there was "significant activity to deny the presence of plutonium," Anderson says.

In July 1998, Denver Mayor Wellington Webb decided to get rid of his own little problem by dismissing Anderson from the water board. She now has a whistleblower case pending with the Labor Department. Without her around, the water board has proposed allowing plutonium to be pumped into the sewer lines at levels 160 times higher than Colorado's drinking water standard for plutonium. Colorado already is the only state that sets any "acceptable" level for plutonium. And the board has rebuffed demands by citizen and environmental groups for a public hearing on the issue. The pipeline has been completed and, as plans now stand, Lowry wastewater will be pumped into Metro's sewage system later this year.

*Laura Orlando is the executive director of the ReSource Institute for Low Entropy Systems in Boston.*

---



ReSource
179 Boylston Street
Jamaica Plain, MA 02130 USA
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Last updated: 7-April-1999
Document URL: http://www.riles.org/paper7.htm
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Attachment DD

Dan Hahn
the Meeting School
Rethania Rd
Rindge N.H. 03461
Pres. NOFA N.H.

I'm here today to speak in support of SB 218-FN-LOCAL as a NOFA N.H. board member and the organizations current Pres. I've been aware of the complexities of the issue. Because the issue is so complex and because I've felt unable to speak to the issue from a scientific view point I have yet to speak out.

Part of my difficulty came from knowing that soil health and plant health are dependent largely on the organic content of the soil. Sludge being organic material and composted organic material in some cases, even better. This is hard to dispute. The risk in using sludge comes from the testing that come along with it. Particularly heavy metals and dioxins.

At this point I could go off on a lecture about how soils behave and try to impress you perhaps with convincing arguments or perhaps try to scare you into thinking that the risks of spreading toxins on farm land are not worth the risk. Which I believe they are not.

Instead I would like to assure you that taking that risk is unnecessary. Until waste treatment can be done in a way that assures an end product free from contaminants we can get along with out sludge on our farm land. We must get along without pollutants particularly in flood plains. I'm not talking about some pie in the sky dreamy notion that in practical terms is unachievable. Many, many farmers in New England right now are protecting land, improving the health of soil, the quality and yeald of crops, and the health of consumers by farming organicly.

Attachment DD

Not only are they physically more healthy but fiscally more healthy. Dairy farmers who are the primary users of municipal sludge in New Hampshire ~~when organic, sell~~ for agriculture, when organic, sell milk for prices unheard of on the conventional market. ~~At~~ some times double the price. There is a ready market for organic milk in N.H. to companies such as Stoney Field Farm Inc. in Londonderry.

Organic farmers succeed by farming with out synthetic materials or methods, all contaminants by toxic substances. Soil kept free from pesticides and in a high state of fertility relies on farmers management of organic matter and minerals. Organic matter is obtained from animal manures and by growing grasses legumes and green manures in rotation with crops like corn and other grain. Minerals are to a large degree already present in the soil and are made available by the biological action taking place in healthy living soil. When not present they can be obtained from a wide range of soil amendments that are easily obtained from North Country Organics for which Blue Seal Feeds in Bow is a dealer.

The risk of spreading contaminants on farm soil is unnecessary and available land should not be condemned by the state of N.H.

Thank you

Dan Holmes

DD. Cont.

VINCE FOY - LEWIS CREEK JERSEYS

| NOFA-VT | | EXAMPLE FARM | | | |
|---|---|---|---|---|---|
| Dairy Technical Assistance Program | | Mar-99 | | | |
| | | | | | |
| | Conventional | .5 Conv, .5 Org | Organic | Organic | Organic |
| EXPENSES | 1994 | 1995 | 1996 | 1997 | 1998 |
| Breeding | $ 2,500.00 | $ 2,900.00 | $ 1,700.00 | $ 5,832.00 | $ 7,823.00 |
| Custom Hire | $ 5,000.00 | $ 9,450.00 | $ 4,150.00 | $ 6,767.00 | $ 6,406.00 |
| Grain | $ 45,000.00 | $ 50,500.00 | $ 73,500.00 | *$ 91,367 | $ 78,960.00 |
| Fertilizer & Lime | $ 1,850.00 | $ 2,900.00 | $ 2,400.00 | $ 3,658.00 | $ 1,938.00 |
| Trucking | $ 220.00 | $ 120.00 | $ 2,625.00 | $ 697.00 | $ 1,496.00 |
| Fuel | $ 3,850.00 | $ 3,650.00 | $ 4,200.00 | $ 4,313.00 | $ 3,887.00 |
| Rent | $ 2,700.00 | $ 3,900.00 | $ 3,700.00 | $ 3,826.00 | $ 4,356.00 |
| Repairs | $ 7,225.00 | $ 6,500.00 | $ 8,900.00 | $ 6,325.00 | $ 11,920.00 |
| Seed | $ 986.00 | $ 576.00 | $ 638.00 | $ 872.00 | $ 741.00 |
| Supplies | $ 9,800.00 | $ 11,500.00 | $ 10,700.00 | $ 13,908.00 | $ 12,845.00 |
| Taxes | $ 4,473.00 | $ 2,825.00 | $ 2,900.00 | $ 2,537.00 | $ 2,588.00 |
| Utilities | $ 6,300.00 | $ 6,600.00 | $ 6,200.00 | $ 7,531.00 | $ 7,000.00 |
| Vet | $ 4,050.00 | $ 4,900.00 | $ 3,400.00 | w/breeding | w/breeding |
| Labor | $ 17,200.00 | $ 12,000.00 | $ 18,200.00 | $ 26,078.00 | $ 27,242.00 |
| DHIA, Jersey CC | $ 3,200.00 | $ 3,000.00 | $ 2,925.00 | $ 3,243.00 | $ 3,100.00 |
| TOTAL | $ 114,354.00 | $ 121,321.00 | $ 146,138.00 | $ 176,954.00 | $ 170,302.00 |
| | | | | | |
| | | | | | |
| INCOME | 1994 | 1995 | 1996 | 1997 | 1998 |
| Milking Herd | 70 | 70 | 70 | 70 | 70 |
| Pounds Shipped | 908,000 | 910,000 | 890,000 | 894149 | 932481 |
| Milk $ income | $ 125,000.00 | $ 137,500.00 | $ 165,000.00 | $ 181,836.00 | $ 191,905.00 |
| Cow sales > 2 yrs | $ 7,874.00 | $ 5,480.00 | $ 5,406.00 | $ 5,865.00 | $ 3,589.00 |
| Heifer sales <2yrs | $ 288.00 | $ 811.00 | $ 3,723.00 | $ 2,167.00 | $ 3,358.00 |
| TOTAL | $ 133,162.00 | $ 143,791.00 | $ 174,129.00 | $ 189,862.00 | $ 198,852.00 |
| | | | | | |
| Debt/Cow | 3000 | 1500 | 1500 | 1500 | 1500 |
| Grain: Milk Ratio | 36% | 36% | 44% | *50% (37) | 41% |
| Milk $/100# | 13.77 | 15.11 | 18.54 | 20.34 | 20.58 |

1. Animals are registered jerseys
2. Used to be a high debt operation and sold development rights when they were transitioning to Organic productio
3. 20% loss in production partly due to decrease in grain fed. Production recovered 10% when the cows adjusted to the new feed
4. Milk premiums did not come into effect until part way through 1996 which added another $2.00 per hundred weight. Had that been available from the beginning of the 1996 year, there would have been an added income of $17, 800 and would have changed the Grain: milk ratio to 40%
5. Transition of farm was not abrupt; transitioned over a 3 year period of time
6. 94 year = conventional, 95 year = 1/2 conventional 1/2 organic, 96-98 years = organic
7. * = Anomaly (see 1997 year)
8. estimated milk $/100# for 1999 = $24.50

Attachment EE

Lara Saffo, Esquire
Post Office Box 336
23 Jackson
North Woodstock, New Hampshire 03262
(603) 745-6369

March 3, 1999

New Hampshire State Senate
Senate Environment Committee
Concord, New Hampshire

RE: Sludge: Senate Bill 218

Dear Senators:

I wish I could be present at the hearing for Senate Bill 218, important legislation that will protect New Hampshire's environment. Please realize that my, and other's inability to attend the hearing does not mean we do not care, deeply, about the issue of sludge in New Hampshire. On the contrary, we have been, and still are, incredibly concerned.

I am in favor of all aspects of Senate Bill 218. This letter, however, will speak to the prohibition on wastewater treatment plants from excluding towns that regulate sludge disposal within their borders.

New Hampshire law specifically permits towns to regulate sludge. However, small towns are being punished when they exercise this right because the larger towns exclude them from utilizing their wastewater treatment plant - effective immediately. This penalty is upsetting, especially when the small towns are thereby forced to accept, in one year, more sludge than the town could possibility generate in a hundred years. It is my understanding that the wastewater treatment plants are not asking the smaller towns to accept sludge generated at the particular treatment plant that the small town utilizes. On the contrary, the wastewater treatment plants are demanding that the small towns accept sludge from any source, including sludge from out of state industrialized cities. One need only look the Department of Environmental Service's chart which outlines the source of sludge and the location in which it is disposed to see that certain small towns are being inudated with more sludge than the town will generate in years.

It is possible that wastewater treatment plants face greater disposal costs (in the short term) if the wastewater treatment plant cannot landspread its sludge. But we need to ask ourselves, how many New Hampshire treatment plants actually face increased cost due to its inability to landspread sludge in a nearby town? Not many. How many New Hampshire treatment plants actually want to spread sludge in a nearby town? Not many.

Moreover, if a wastewater treatment plant has to spend extra monies to dispose of a smaller town's sludge (or an amount roughly equivalent to the amount of sludge a small town generates) then the wastewater treatment plant can explain the additional expense, and charge the smaller town additional fees to cover the increased cost of disposing the smaller town's sludge.

I recently attended a hearing on pending house bills and listened to an employee of a wastewater treatment plant explain that it is more costly to dispose of sludge if it cannot be landspread. In the short term, this may be true. However, what struck me was the apparent belief that the citizens of New Hampshire would prefer a less costly manner of disposing sludge, even if that cheaper mechanism carried a greater possibility of contamination. New Hampshire citizens have consistently shown, in polls, and in spirit, that they want to protect the environment, and that they consider protecting the environment one of the most important functions of government. I believe New

Hampshire citizens would prefer a more expensive manner of waste disposal, if the environment is protected.

I know that I would rather pay substantially more to landfill sludge than to pay less to landspread sludge. I furthermore believe my fellow townspeople would agree. But without Senate Bill 218, smaller towns are not even given that option. Worse, we are being forced to accept material on our land that we strongly believe is not safe, especially as presently regulated. And the smaller towns are powerless to do anything about it if its wastewater treatment plant can exclude the town from using its facility.

Please vote in favor of Senate Bill 218. Thank you for your time and consideration.

Lara Saffo

Attachment FF

**Ralph Kirshner**
**16 Whortleberry Island**
**Center Harbor, NH 03226**

**voice/fax : 603-569-1517**
**email: rmk25@cornell.edu**

24 March 1999

Dear Senate Environment Committee Members:

As I will be unable to testify in person at the hearing on March 25th on SB 218, regulating the land application of sewage sludge, I would like to submit the following written testimony.

As I have told the Committee on other occasions, as an island resident using Lake Winnipesaukee for drinking water, I am personally concerned with issues affecting water quality. I therefore support SB 218.

The U.S. Clean Water Act, first passed in 1972, changed the way we deal with human waste. Congress mandated and funded new sewage treatment plants, which concentrated this waste into sewage sludge, or "biosolids" as the U.S. Environmental Protection Agency redefined it in 1992. Whatever the term used, its disposal is still a problem.

The EPA banned ocean dumping of sludge in 1991. New York City now ships trainloads to Texas and other states; Mayor Giuliani recently characterized his city's waste exporting as a form of cultural exchange. New Hsampshire is a lot closer to New York City than Texas. Without adequate regulation, we will be taking a large load off the Mayor's mind.

Other states, including Massachusetts, have enacted strict regulations on land disposal in their own states, preferring to ship it elsewhere, including New Hampshire. The EPA has reclassified some types of sludge from hazardous material to fertilizer, allowing its application on farmland and forests. The term "biosolids" also includes paper mill waste, also shipped and spread here. Paper reclassifications do not change real paper product pollution.

Human waste has been used as fertilizer for thousands of years, but sludge is a contentious issue. The questions are not only esthetic. Sludge can contain toxic chemicals, disease-causing organisms, poisonous heavy metals like lead, and even radioactive compounds, in addition to fertilizer components like nitrates and phosphates that can be harmful if they pollute surface or groundwater. Unfortunately, sewers are often used for the disposal of materials other than wastewater, and many citys have combined storm drains and sanitary sewers, where anything washed off the streets ends up in the sludge. The EPA regulates only 21 of the tens of thousands of possible pollutants in sludge, not including some like dioxins and pcb's which are known problems; this bill begins to address them.

The New Hampshire Department of Environmental Services, which is responsible for regulation, is also a major producer of sludge from the Winnipesaukee River Basin plant it runs in Franklin, which treats sewage from Moultonboro, Center Harbor, Meredith, Laconia, Gilford, and other neighboring communities. Some of this is spread on pastureland and cropland in Franklin and elsewhere. Many farmers welcome the stuff; as fertilizer it is either free or they are paid to take it. Some, however, claim their cattle have been poisoned by heavy metals, and neighbors downwind have also reported serious heath problems. New Hampshire is also one of the few places to allow sludge to be used for reclaiming gravel pits, a practice opponents warn has severe potential for contaminating underlying aquifers and drinking water supplies.

(more)

I understand that Senator Wheeler is submitting an amendment to SB 218 to end this practice, and I also support that amendment. If DES paid attention to paragraph I of RSA 155-E:5, there would be no need for it. RSA 155-E:5, I begins: "Except for exposed rock ledge, all areas which have been affected by the excavation or otherwise stripped of vegetation shall be spread with topsoil or strippings, if any, but in any case covered by soil capable of sustaining vegetation..."

Please note that reclamation is supposed to be done with "topsoil or strippings" and "soil capable of sustaining vegetation," NOT SLUDGE! Sludge is not soil!

DES, however, has twisted the law to allow it to dispose of the sludge it produces from the Winnipesaukee River Basin Project, polluting our groundwater. A DES conflict of interest once again has been resolved in favor of bureaucratic rump covering rather than the public interest.

In fact, if DES adequately enforced RSA 485:17 which makes pollution a crime, there would be less need for this whole bill. That law says that anyone placing in **or near** surface waters "any substance or fluid that **may** cause such water to become impure" is committing a misdemeanor felony (emphasis added). Since virtually everywhere in the state is near a "stream tributary thereto" of surface waters, and since almost nobody denies that sludge **may** cause pollution, why are we spreading it?

The answer is obvious: sludge is big business in this state. SB 218 is actually less restrictive than current law (RSA 485:18) if it were enforced. The State House is showing signs of yet another political mire. Please pass this bill and help us out of it.

Sincerely,

Ralph Kirshner

Ralph Kirshner

# Speakers

# SENATE ENVIRONMENT. COMMITTEE

Date April 1, 1999 Time 1:30 Public Hearing On SB 218-FN-L

**Appearing in FAVOR:** (Please print) **Please check box at left to speak.**

| Speaking? | Name | Address | Representing |
|---|---|---|---|
| ☒ | ~~Jim Dodge~~ | | |
| ☑ | Caroline Snyder | PO Box 38 N. Sandwich | Citizen for a Future NH |
| ☐ | | | |
| ☒ | Chris Ruegsegger | | Sierra Club |
| ☒ | Doug Bogen | | Clean Water Action |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |

Neither for or against: NED BEECHER, New England Biosolids

**Appearing in OPPOSITION:** (Please Print) **Please check box at left to speak.**

| | | | |
|---|---|---|---|
| ☒ | Paul Currier | 64 N. Main | NHDES |
| ☒ | Bruce Kidrick | | Town of Hooksett WWTP |
| ☒ | Jim Dodge | Dochmere | FARMER |
| ☐ | John Hoadley | Meredith | |
| ☒ | David Bernier | Gorham Water & Sewer | |
| ☑ | Doug Steele | Dover WWTP | NHWPCA |
| ☒ | Alwynne Hellfach | Piscataqua Enviro. Serveses | NHWPCA. |
| ☒ | Sue Roberts | Belmont | FARMER |
| ☒ | Michael L Townsend | Lebanon | FARMER |
| ☒ | Charles L Hanson | Center Harbor | Farmer |
| ☒ | Shelagh Connelly | Holderness | White Mtn Res. Mgmt |
| ☒ | Brenda Clemons | Concord | NH Farm Bureau |

# SENATE ENVIRONMENT. COMMITTEE

Date April 1 Time Public Hearing On SB 218-FN-L

**Appearing in FAVOR:** (Please print) **Please check box at left to speak.**

| Speaking? | Name | Address | Representing |
|---|---|---|---|
| ☑ | Melone Shields | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |

**Appearing in OPPOSITION:** (Please Print) **Please check box at left to speak.**

- ☑ James A Bailey Warner Village Water District, Warner, NH
- ☑ Kurt Blomquist, City of Keene Public Works Dir, Keene
- ☐ Dick Bouley, American Forest & Paper Association
- ☑ Henry Veilleux Wheelabrator
- ☑ Jason Stock BFI
- ☐ Michael Hunscom City of Concord
- ☑ Judy Silva NHMA
- ☐ Peter Schaub Sencook Water & Wastewater NH
- ☐ Daniel Harvey Epping NH Farmer Applehurst Farm
- ☑ Chip Chesley Town of Merrimack
- Ken L Hanson Town of Center Harbor

# SENATE ENVIRONMENT. COMMITTEE

Date May 6 Time 1:30pm Public Hearing On SB 218

**Appearing in FAVOR:** (Please print) **Please check box at left to speak.**

| Speaking? | Name | Address | Representing |
|---|---|---|---|
| ☑ | Helene Shields | Acton | CFNH |
| ☑ | Doug Bogen | | Clean Water Action |
| ☑ | Rep Dick Ames | | |
| ☒ | Rep Betty Hall | Bartlett | NH |
| ☒ | Tom Irwin | 27 N. Main St. Concord | Conservation Law Foundation |
| ☐ | Dan Holmes | 56 Thomas rd. Rindge | NOFA |
| ☒ | ~~Sr~~ RALPH KIRSHNER | CTR. HARBOR, NH | SELF |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |

**Appearing in OPPOSITION:** (Please Print) **Please check box at left to speak.**

| | | | |
|---|---|---|---|
| ☐ | Shelagh Connolly | PO Box 1081 Ashland NH | RMI |
| ☐ | | | Merrimack |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
| ☐ | | | |
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| ☐ | | | |
| ☐ | | | |

# SENATE ENVIRONMENT. COMMITTEE

Date May 6, 1999 Time 1:15 pm Public Hearing On SB 218-FN-L

**Appearing in FAVOR:** (Please print) **Please check box at left to speak.**

| Speaking? | Name | Address | Representing |
|---|---|---|---|
| ☑ | Paul Adams | Chichester NH | Tech. Assistance for Pollution Prevention Inc |
| ☑ | Sen. Rob. F. Disnard | Self- Co-sponsor | |
| ☑ | Jim Dodge | Lochmere, N.H. | Self/Town |
| ☑ | ~~Alex Duran~~ | ~~BFI Organics~~ | |
| ☑ | Katherine Rhoda | PO Box 563, Bethlehem, NH 03574 | myself |
| ☑ | Shirley Grilli | RD1 Box 36 Pike NH 03780 | myself |
| ☑ | " " | " to read testimony of Lara Saffo | |
| ☐ | Caroline Snyder | CFNH | |
| ☐ | Wendy Lannon | R.N. | |
| ☒ | Chris Reeggeberg | U.H Sierra Club | |

→ over

**Appearing in OPPOSITION:** (Please Print) **Please check box at left to speak.**

| | | |
|---|---|---|
| ☑ | Alex Duran | BFI Organics |
| ☑ | Judy Silva | Nt Municipal Assoc. |
| ☑ | Brenda Clemons | NH Farm Bureau |
| ☑ | Henry Veilleux | Wheelabrator |
| ☑ | Paul Currier | NHDES |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

In favor

Melanie Shields CFNH

# Testimony

# The Senate of the State of New Hampshire

107 N. Main Street, Room 302, Concord, N.H. 03301-4951

KATHERINE WELLS WHEELER
Vice President - Operations
District 21

Office 271-2111

TTY/TDD
1-800-735-2964


Chairman Russman and members of this committee, thank you for the opportunity to speak before you today in support of Senate Bill 218 as amended. SB 218 has been introduced in response to the new sludge rules adopted this month by the Department of Environmental Services (DES).

The purpose of SB 218 is to legislatively provide the management, testing, sludge quality standards, and land application standards that will protect New Hampshire's agricultural resources, water resources, wildlife, and the health of its citizens. As amended, SB 218 focuses on the regulation of Class B sewage sludge, which is lower in quality than Class A. The new sludge rules ignore many of these environmental concerns.

## WHY THIS BILL IS NECESSARY

The *Harper Collins Dictionary of Environmental Science* defines sludge as a " viscous, semisolid mixture of bacteria- and virus-laden organic matter, toxic metals, synthetic organic chemicals, and settled solids removed from domestic and industrial waste water at a sewage treatment plant." Please see the sewage sludge question and answer sheet.

As a regulator, the Department of Environmental Services should take a cautionary approach. to the way a substance with this definition is used in New Hampshire. Instead, the new sludge rules adopted by DES are designed to make the use of sewage sludge as easy as possible. They favor industry needs and the overall goal of DES- to encourage the use of sludge rather than to make its use as safe as possible.

The important issue to remember in this debate is that DES is basing its new state rules on federal regulations that are scientifically unsound. Please see the "EPA Sludge Magic" sheet you received in the mail from Dr. Snyder.

## THE BASIS FOR THIS LEGISLATION

The recommendations in SB 218 are based on peer reviewed scientific evidence. Dr. Snyder has provided you with the scientific citations that support the language in the bill. She will also explain the specific provisions of the bill.

The prohibition in section 2 of the bill against using Class B sewage sludge and industrial paper mill sludge to reclaim spent gravel pits located over aquifers was also recommended by DES during the rulemaking process. This recommendation was abandoned due to industry pressure.

# The Senate of the State of New Hampshire

107 N. Main Street, Room 302, Concord, N.H. 03301-4951

KATHERINE WELLS WHEELER
Vice President - Operations
District 21

Office 271-2111

TTY/TDD
1-800-735-2964


The maximum metal concentrations in section 3 of the bill that must be requires by waste water treatment facilities on January 1, 2001 were also recommended by DES during the rulemaking process. Under pressure from the business community, compliance with these standards that would result in cleaner sludge is now voluntary on the part of industry.

The bill also relies on language in the old sludge rules that in many cases was more restrictive than the new sludge rules. It is important from a regulatory standpoint that the regulated community follow the nonpartisan University of New Hampshire best management practices for land application. This legislative requirement negates the new rule that the regulated users of sludge may use their own best management practices.

**FALLACIES IN THE FISCAL IMPACT STATEMENT**

SB 218 does not require landfilling as the only option for sludge disposal. The fiscal note for SB 218 does not specify how, on a community-by-community basis, this bill will eliminate the land application of Class B sewage sludge. The current focus on sludge use is for agricultural applications, which this bill regulates. Municipalities should look at new and safer uses for sludge that keep it out of our food chain.

The University of New Hampshire Cooperative Extension recommends that in order of priority sewage sludge first be applied to non- agricultural land. Municipalities have numerous options for using sludge that are certainly not prohibited by this bill, and that are recommended by UNH.

Non- cropland uses include capping landfills and roadside restoration. Non- food crop uses include turf for ski slopes, athletic field renovations, and landscape sites. Non- food crop uses also include nurseries for deciduous trees and shrubs.

The fiscal impact statement should not include increased costs for meeting new metal concentration limits. Dr. George Estes, who has worked on UNH's best management practices, has consistently argued that New Hampshire produces sludge that is low in metals. Assuming this is true, industries will have no trouble meeting the new maximum metal concentrations in the bill, and the sludge will not have to be landfilled.

# The Senate of the State of New Hampshire

107 N. Main Street, Room 302, Concord, N.H. 03301-4951

KATHERINE WELLS WHEELER
Vice President - Operations
District 21

Office 271-2111

TTY/TDD
1-800-735-2964


If the sludge from out-of-state facilities cannot meet the low metal requirements in SB 218, there is no reason for requiring New Hampshire municipalities to continue importing sludge and then having to pay for its landfilling- while the sludge haulers continue to make a profit. New Hampshire can rely on public health and safety concerns to prohibit the importation of low-quality out-of-state sludge. In fact, a federal court has upheld the authority of Rappahannock County in Virginia to ban out-of-state sludge for just these reasons.

As amended, SB 218 deals with many DES concerns. A new fiscal note should be prepared with a lower and more realistic fiscal impact.

April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, NH 03301

**RE: SB 218 - Inexpedient to legislate**

Dear Chairman Russman:

For the record, my name is Erick Sawtelle and I farm fields in Dover, Madbury, Barrington, Durham, Lee, Newmarket, Newfields, and Epping, New Hampshire. We manage over 680 acres and produce feed for 450 head of dairy and beef cattle. I have utilized biosolids since 1993 as part of my nutrient management program.

***As a full-time farmer I urge the committee to vote inexpedient to legislate on SB 218.***

Most of the language in this bill is redundant to the existing Env-Ws 800 Sludge Management Rules recently revised by the NH Department of Environmental Services. There does not seem to be any good reason to address such issues by statute when regulation has already been adopted to address biosolids utilization.

One area that exemplifies the myriad problems with SB 218 as written is the issue of stockpiling as specified in the proposed language of paragraph 2.VIII which limits stockpiling "*up to and including thirty days before any planting or seeding*". This single provision will eliminate stockpiling for the other eleven months of the year. We currently stockpile for 4 – 6 months in advance of planting or seeding in order to get enough biosolids to meet the crop needs. If SB 218 passes, I will not be able to effectively use biosolids to fertilize my crops. Also, w*hat will be done with the biosolids for these other eleven months?*

As a sponsor of this bill, my Senator [Katherine Wheeler] does not represent my views on the beneficial use of biosolids as a recyclable resource. For this and many other reasons, which I would be happy to expound upon in greater detail, **I urge the committee to vote inexpedient to legislate on SB 218.**

I am happy to speak with any committee members about biosolids use on my farm. We hope to be spreading biosolids in mid-May and you are invited to come and see first-hand how this resource benefits my land and nutrient management program.

Sincerely,

Erick Sawtelle

Erick Sawtelle
Pinewoods Yankee Farm
288 Lee Hook Road
Durham, NH 03824
603.659.8106

# TOWN OF LITTLETON

Town Offices Two Union Street Littleton, N.H. 03561
Telephone: (603) 444-3996 Fax: (603) 444-1703


April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Rm 102
Concord, NH 03301

Subject: SB 218, Regulating the Land Application of Sewage Sludge

Dear Chairman Russman:

The Town of Littleton currently utilizes land application of sludge (class B) as a method of disposal for the sludge generated at the wastewater treatment facility. In addition, many small communities surrounding Littleton rely on the Littleton Wastewater Treatment Facility for the disposal of septage generated in their community. As proposed, SB 218 would severely restrict the land deemed suitable for application of sludge. Reuse and recycling of all materials is vitally important to not only protection of the environment, but also to maintain a financially viable Wastewater Treatment option for the community.

We believe the new Sludge Management rules developed by NHDES Env-Ws 800 are sufficiently protective of public health and the environment and trust that NHDES will continue improving the rules as additional scientific evidence warrants.

The Town of Littleton can not support a bill that puts an additional burden on our taxpayers. As proposed SB 218 will significantly increase the costs of disposal of the sludge generated at the Wastewater Treatment Facility.

The Town of Littleton does not support SB 218, which will essentially ban the land application of sludge. We would ask that you consider voting SB 218 inexpedient to legislate.

Thank you for your consideration.

Sincerely yours,

Donald R. Jutton
Town Manager

MICHAEL J. BOBINSKY
Director of Community Services

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April 1, 1999

# City of Dover, New Hampshire

## COMMUNITY SERVICES DEPARTMENT

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, New Hampshire 03301

Re: SB 218

Dear Chairman Russman:

The City of Dover is strongly opposed to SB 218 regulating the land application of sewage sludge. As we understand the proposed legislation, this bill will prohibit the ability for the City of Dover to successfully market and recycle our composted sludge. The City of Dover's WWTP produces a Class "A" Bio-Solids and due to its high quality, have been able to successful secure contracts with vendors who compensate the City for the product. Dover produces approximately 12,000 cubic yards of product per year and allows local residents free access to the product for landscaping purposes. Interestingly enough, the City generates approximately $8,000 per year in revenue from the sale of our Bio-Solids. This bill, if passed, would convert a revenue generator into an expense item in the $280,000 per year range. To that end, the City views this as an unfunded mandate and therefore in violation of NH Constitution Part 1, Article 28-a.

Other reasons for the Senate Committee to reject this proposed legislation, include the following:

1. Many of the notification requirements, regulatory standards and management practices are already addressed in existing NHDES Sludge Management Rules, which the City of Dover strictly follows.

2. The City of Dover's WWTP sludge composting operation has been a leader in the field of beneficial use of biosolids in the State. Our quality control and management practices have resulted in our product being sought after by private contractors, municipal staff and local residents. It is outrageous to imaging that a time when the State and our Region is concerned over future landfill space, that we would create state mandates which would eliminate this successful recycling effort and force this product into our regional and local landfills at considerable expense. Based on our production of approximately 4,000 wet tons of sludge per year, the disposal cost to the City, (assuming the availability of landfill access at $70 per ton), would be $280,000. The City of Dover has not budgeted for this, and would necessitate increasing our sewer rates to our customers to cover these new expenses.

3. The City of Dover is most concerned over environmental issues and shares the Committee's interests with protecting the environment. However, the Bill, as drafted appears to be vague and provides no scientific basis for added restrictions to the State DES sludge management program.

Respectfully,

Michael J. Bobinsky
Director Community Services



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BFI Organics Testimony on SB 218

I am Alex Duran, an environmental engineer with BFI Organics, one of the firms managing organic residuals in New Hampshire and adjacent New England states. Thank you for this opportunity to provide testimony on SB 218. We are opposed to this bill because it goes too far in restricting the beneficial re-use of residuals which would otherwise be placed in solid waste landfills, adding to the capacity strain already facing those landfills, some of which are owned by BFI. BFI Organic in New Hampshire is principally involved in the land application of paper mill residuals for agricultural and geotechnical applications including fertilizer use in farm fields, capping of closed landfills and reclamation of spent sand and gravel pits.

Several provisions of SB 218 are poorly crafted and unworkable from our perspective, including:

The requirement to provide written notice to all persons "using"; commercial, institutional or residential buildings within a radius of 200 feet around the application area.

The requirement for recording in the Registry of deeds a notice giving specifics of the application project. This requirement may not conform to the existing procedures for content of documents at the various Registries.

The prohibition of disposal of solid waste sludges at a facility permitted by the sludge management rules runs counter to the basic purpose and intent of the recently revised solid waste management rules.

The requirement for maintaining soil pH between 6.5 and 7.0 for 5 years from the date of application is impractical since lime applications, which are commonly required in New Hampshire soils, will often raise the soil pH above 7.0.

The proposed requirement of a 250-foot setback is already in effect for designated rivers under the New Hampshire River Management Act.
The requirements for restrictions of stockpiling on flood plans the requirements for depth of unsaturated soil and for maximum allowable slopes of farm fields are already addressed within the existing DES Sludge Management Rules.

The requirements for POTWS to list all chemical constituents and the restrictions of metal contents in sludges have already been addressed in the recently strengthened existing DES rules.

For these and other reasons stated by BIA, we strongly oppose this attempt to further restrict the beneficial re-use of organic residuals in New Hampshire.

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April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, NH 03301

**RE: SB 218 - Inexpedient to legislate**

Dear Chairman Russman:

The New Hampshire Water Pollution Control Association (NHWPCA) is strongly opposed to SB 218 regulating the land application of sewage sludge. As written, this bill will in effect be a ban on the beneficial use programs that have been underway for the past twenty-five years in New Hampshire. ***We urge the committee to vote inexpedient to legislate on this bill.***

There are several reasons SB 218 should be dismissed as inexpedient to legislate.

1) The bill attempts to address issues such as notification, metal limits, site suitability, and management practices that are already addressed through the NH Department of Environmental Services (NH-DES) Env-Ws 800 Sludge Management Rules. These issues belong in regulation, not statute.

2) The language in the bill is ambiguous and provides no discernable scientific basis for added restrictions that the NH-DES already regulates in the existing technical sludge management program.

3) Requiring landowners to record the use of "non-low metals sludge" in the registry of deeds is unreasonable and serves no purpose, especially when other materials such as commercial fertilizers, manures, herbicides and pesticides are not also required to be registered. Furthermore, the "high metals sludge" in New Hampshire are already "low-metals sludge" when compared to the federal and other state metals standards.

4) Highly technical and complex issues such as dioxin levels and use restrictions is a regulatory issue and should be handled by the NH-DES staff who have the expertise and resources to properly regulate. Debate and promulgation of standards by a legislative body with no scientific basis is not a sound approach to this issue.

5) Wastewater treatment facilities in New Hampshire enjoy a high rate of recycling and beneficial use of the biosolids generated annually throughout the State. However, requiring these facilities to accept septage from other towns that may have a ban on recycling biosolids is a policy inconsistent with existing statute (RSA 486:13 Disposal of Septage) requiring all towns to provide an outlet for their own septage. In addition, the cost for recycling biosolids increases due to local bans. It would be

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inconsistent for a host WWTF to accept septage from a ban-town thereby increasing its own costs for handling and recycling of the final biosolids produced.

6) If SB 218 is enacted to law, the subsequent increased costs will be in violation of the NH Constitution Part 1, Article 28-a that protects municipalities from unfunded state mandates.

There are several other specific details of SB 218 that are of concern to the NHWPCA. However, rather than analyze each component of the bill, ***the NHWPCA respectfully requests that the committee vote "inexpedient to legislate" and let the newly revised Env-Ws 800 Sludge Management Rules, the existing random testing program, and the competent technical staff of the NH-DES regulate the beneficial use of biosolids***.

Respectfully submitted,

Douglas W. Steele, II
President
New Hampshire Water Pollution Control Association

cc: Harry Stewart, P.E., NH-DES
Chairman Musler, Environment & Agriculture Committee
Judy Silva, Esq. - NH Municipal Association
Susan Arnold, Governor's Office

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April 1, 1999

The Honorable Richard L. Russman, Chair
Senate Environment Committee
Legislative Office Building, Rm. 102
Concord, NH 03301

Re: SB 218, "Regarding the Land Application of Sewage Sludge"

Dear Chairman Russman:

This letter will provide our formal comment on the proposed legislation, SB 218, "An Act Regarding the Land Application of Sewage Sludge". This legislation contains numerous provisions, which either alone, or together as the entire bill, if adopted, would end land application and the successful recycling of biosolids in New Hampshire. Bio Gro strongly opposes this bill and will address our concerns in the order in which they appear in the legislation.

1. Public Notice

SB 218 would require extensive personal notice prior to the commencement of operations for land application. This would require a letter (certified to verify mailing) to each abutter within 200' of a land application area. This provision would apply to all biosolids, even Class A products that are purchased at retail outlets. Is it the intent of the sponsors to require each homeowner to sent certified letters to their neighbors each time they purchase a bag of compost or Milorganite at Walmart?

With regard to Class B land application, this provision is unnecessary and overburdensome. First, as land application is prohibited under Env-Ws within 200' of an occupied dwelling (500' if topdressing), this provision is unnecessary. Furthermore, both RSA 485-A:5 and Env-Ws 800 contain extensive notification, both at the time of submitting an application and prior to the commencement of spreading. Notices about the activity are provided to abutters by mail at the time the permit application is submitted so that comment and information can be shared. Public notice by publication in the local newspapers and posting of land application sites provides additional notice to residents and municipalities once a permit is granted and spreading is to occur. The bill would require that a letter be sent to "other persons using commercial, institutional or residential buildings within the application area or 200 feet of the intended treatment area". As biosolids are not applied within 200' of abutting occupied dwellings, this provision is unnecessary as there would never be a building within the application area. However, even if nearby buildings were within this setback, how is an applicant going to be able to

identify "other persons using commercial, institutional or residential buildings"? Does this mean that every customer of a commercial property requires a letter of notification or every visitor to a residence?

2. Recordation of Non-Metal Sludge Use

This section would require that any biosolids which do not meet the specified standards as a "low-metal biosolids" would require that the generator file the most recent lab analysis along with a notice at the registry of deeds for the property in which the biosolids were applied. This provision would apply to both Class A products, distributed in the general stream of commerce such as Milorganite and compost, as well as Class B biosolids.

There is no scientific or technical justification to require such notification on metals content with the registry of deeds as there is no increased risk to the public health or environment from metals at land application sites. All fertilizers have varying levels of the regulated metals, some at much higher levels than biosolids. For example, mined rock phosphates contain much higher levels of cadmium that what is permitted for land application for biosolids. Shouldn't these fertilizers contain the same notification as there would potentially be a higher loading rate? Furthermore, as information about the land application site is already part of the public record at the Department of Environmental Services, there is no need for the additional notifications and filings at the registry of deeds.

3. Molybdneum Level/Metals Concentrations

There is no scientific or technical justification to legislatively mandate the quality standards for biosolids. The Department of Environmental Services in conjunction with the Bureau of Health Risk Assessment has carefully evaluated this issue and have determined that the quality standards of Env-Ws 800 is highly protective of New Hampshire's public health and environment. Establishing these levels by legislative mandate eliminates the Department's initiative to develop incentives for generators to be able to continue to work toward lowering the levels of metals in their biosolids. The metals levels mandated by this legislation would prohibit many N.H. municipalities from participating in land application or recycling programs resulting in higher management costs as alternatives options such as landfilling and incineration (out-of-state) are implemented. Furthermore, New Hampshire's farmers would lose the benefits of a safe and valued nutrient source.

4. Prohibition of Land Application on Forest Land

There is no scientific or technical justification to ban land application of biosolids on our forestland, especially when such a program would provide many benefits to our forest ecosystem. The Pacific Northwest has successfully applied biosolids on forestland and has provided many environmental benefits which has been extensively documented through the work of Dr. Charles Henry at the University of Washington. Biosolids applications in the forest provide important nutrients for improved growth and harvest yield. It also provides an improved understory which provides important habitat for wildlife. Soil quality is also improved which aids in preventing erosion and improving water quality in these areas. Several fact sheets from the Northwest Biosolids Management Association on the benefits of forest applications are attached for your information.

5. Solid Waste Restriction

This section would prohibit the use of solid waste products such as wood ash or certified waste derived products with biosolids. This would also prohibit the composting of sludge with leaf and yard wastes or food wastes which are defined as solid wastes. There are many solid waste products which are valuable feedstocks for composting operations, or to agricultural operations as a soil amendment which would no longer be permitted for use under this section. The Department has extensive regulations both under the Solid Waste Rules and the Sludge and Septage Rules providing the appropriate guidelines and management practices for these products. To eliminate these programs will add further burdens upon our landfills and solid waste management infrastructure. To promote disposal over recycling options is contrary to the waste management hierarchy established by the legislature and the recycling goals of the State.

6. Soil pH Maintenance

This section would require that the soil pH be maintained for all land application sites (including compost or other Class A products) between 6.5 and 7.0 during use of the site and for 5 years thereafter. There is very low mobility of metals from biosolids to warrant this level of pH maintenance. Metals in biosolids are not highly soluable and have very strong bonding properties with phosphorus, iron and soil particles. Field studies have clearly documented that pH is not as important as a management option for monitoring the availability or solubility of certain metals. The Department has developed highly protective quality standards and site management practices to address potential concerns about the effects of metals in biosolids in their comprehensive Env-Ws 800 regulations.

7. Minimum of 250' Setback from Water

Buffer strips and setbacks are important management tools in agricultural operations. Buffer strips as small as 10' (ten feet) can be effective filters for surface runoff, capturing both nutrients and residues from other products used in production. The Best Management Practices published by the N.H. Department of Agriculture, Markets & Food specify 20 feet as a minimum buffer for agricultural operations. A study conducted at Clemson University comparing animal manures, biosolids and commercial fertilizers and their impact on surface water due to runoff from agricultural fields found that of these fertilizer choices, biosolids had the least impact on surface water quality.

The Department has established highly protective setbacks (125'/75') which were based upon input from New Hampshire researchers and agricultural advisors. The safety of these setbacks is clearly documented by the fact that even under the former distances of (100'/50'), there has been no degradation of New Hampshire's waterways when the Department's setbacks have been followed.

8. Minimum Depth to Bedrock

This section would arbitrarily increase the minimum depth to bedrock from 2' to 3'. This would apply to both Class A products such as compost or pellets and Class B biosolids. The use of stringent quality standards and agronomic rates make biosolids a very safe and environmentally sound fertilizer or soil amendment choice. Organic fertilizers such as biosolids and animal manures are often the preferred fertilizer choice as they are a slow-release nitrogen source and not as prone to leaching as others such as commercial fertilizer. This arbitrary standard will eliminate shallower soils which may be under active cultivation or forestland from receiving the benefits of biosolids. The result will be that more leachable products will be used instead of biosolids which is contrary to the intended purpose of improving water quality.

9. Floodplain Prohibition/30 Day Field Stacking Site

This section will prohibit the use of biosolids in the floodplains. This includes both Class A and Class B products and will deprive many farmers of this highly valuable nutrient source as much of our most productive farmland is located along the floodplain. There is no scientific or technical justification for such a prohibition. In fact, this prohibition could impact ongoing research sites of the University of New Hampshire.

The second provision of this section would limit field stacking to only 30 days and on "unsaturated soil with a depth of 4' to groundwater". This would require the construction of permanent facilities in the field with an impervious layer for these 30 day stockpiles.

This would eliminate land application in New Hampshire. Farmers will not give up valuable cropland for the construction of permanent facilities all over their farm. Field stacking, especially through the winter is necessary to ensure that enough material is to meet the crop needs of the farm is delivered prior to planting. This becomes very important for spring crops such as corn where there is a short window of time for spring planting. Many generators simply do not have production capabilities to generate the all of the biosolids needed for a crop, especially on the larger farms, in a 30 day period of time. These prohibitions and arbitrary restrictions will only provide economic and operational incentives to generators to use other management options such as landfilling and incineration (out-of-state).

The Department has developed highly protective standards for field stacking sites which are consistent with the storage and management of other animal manures and should remain in effect.

10. Limiting Land Application to 8% Slopes

This provision would require that all applications be limited to slopes of no greater than 8%. There is no technical justification for such an arbitrary restriction. The effect of this section will eliminate biosolids use from many of New Hampshire's agricultural operations. Land application of biosolids on slopes of 8% - 15% pose no greater risk to the public health or environment than do the use of other manures or commercial fertilizers. In fact, studies such as the Clemson study referenced earlier, have demonstrated that biosolids are often the preferred fertilizer choice as they have the least impact to surface waters. The Department has established highly protective requirements for agricultural applications on slopes of 8% - 15% which are based upon safe and environmentally sound agricultural and conservation practices.

11. POTW Industrial Wastewater Contributors

This section is unnecessary as this information is already required under Env-Ws 800 as part of a Sludge Quality Certification application process. There is no need to legislatively mandate provisions already enacted by regulation.

12. Dioxin Standard

This section proposes to mandate a dioxin standard which has already been enacted by the Department based upon input from the Bureau of Health Risk Assessment. To arbitrarily

mandate a specific standard eliminates the Department's ability to continue to work with the Bureau on developing risk-based dioxin standards as further information and research becomes available.

13. Sludge Quality Certification

The Department requires a Sludge Quality Certification for biosolids to be land applied in the Env-Ws 800 rules. There is no need to legislatively mandate a program already developed with clear standards and definitions in the regulations. The Department has expended considerable effort into developing a clear and technically sound review process for obtaining an SQC and there is no justification for limiting their ability to administer the program as developed.

14. UNH BMPs for Land Application/Agronomic Rates

This provision mandates that UNH Cooperative Extension review each permit application and agronomic supporting documents and provide a field by field nutrient management recommendation which is inappropriate and not under their organizational mandate. Furthermore, this would restrict NRCS, Soil and Water Conservation District staff or other agricultural advisors from being able to develop agronomic recommendations, even when Class A products such as compost are used.

Farmers utilize the services of numerous agricultural advisors including, but not limited to UNH Cooperative Extension agents, NRCS (especially in the development of manure management facilities and soil conservation plans) and certified crop advisors or other agricultural advisors to develop their nutrient management plans to determine their off-farm fertilizer and soil conditioning needs. UNH Cooperative Extension does not have the sole authority to develop guidelines for nutrient management planning for individual sites using biosolids. This requirement exceeds the advisory consultant role of UNH Cooperative Extension as it transfers the administration of the development of nutrient management plans to this agency.

The Department has addressed the need for nutrient management plans and development of site specific agronomic rates in the Env-Ws 800 rules which makes this requirement unnecessary.

15. Sludge Containing Dioxin

This section requires that any sludge containing dioxin follow additional management

practices such as the prohibition of grazing as well as using the land for the crops for human consumption.

First, what is the definition of a "sludge containing dioxin". Current testing methodologies have established detection limits and either the compound is detected at a reportable level or is listed as "not detected". As proposed, this legislation would ban the use of all sludges, as there is no available testing methodology which can accurately state there is no dioxin in the sludge. Furthermore, there is no definition of PCDD and PCDF in this legislation. This vague and arbitrary language would essentially ban the land application of biosolids (both Class A and Class B) as well as other residuals.

This section places additional burdens upon subsequent landowners to provide notification that biosolids containing dioxin were used on the site. Such a provision is unnecessary, overlyburdensome and unenforceable. Furthermore, there is a substantial public record on each land application site available at the Department which makes additional notification and recordkeeping unnecessary.

The Department after careful review and input from the Bureau of Health Risk has developed a very conservative and highly protective dioxin standard. There is no justification or documented evidence that this standard is not protective of New Hampshire's public health or environment and therefore, the Department's standard should continue to stand.

16. Sludge Hauler Permits

The Department has developed an extensive hauler permit procedure which is designed to be both cost-effective and efficient to administer (both monitoring and enforcement). There is no justification to duplicate this effort through arbitrary legislation. Furthermore, this section as proposed may conflict with federal transportation laws as it appears it would apply to all haulers (both Class A and Class B), even those who simply haul through the state.

17. Wastewater Treatment Plant Prohibition on Septage

New Hampshire has very limited resources available for the treatment of its wastewater or septage. Many communities do not own or operate their own wastwater treatment plants and wastewater treatment is managed entirely by relying upon homowners to routinely pump their septic tanks. The reality is that this septage must go somewhere and the only options available are either a wastewater treatment facility for further processing (resulting

in biosolids) or to a septage land application site.

For a number of reasons, largely fueled by very emotional, but unsubstantiated claims, many New Hampshire communities have found themselves involved in the debate on how to manage biosolids, whether generated in town or not. The increase in the number of towns which have adopted highly restrictive or outright bans has resulted in an increased financial burden upon those communities with wastewater treatment facilities. These wastewater treatment plants are seeing increased requests for septage treatment, while seeing decreased availability for the most cost effective management option, land application.

The simple reality is that if a community is not providing wastewater treatment services with affordable disposal options, it should not be burdening other facilities. As all communities are suppliers of biosolids, then all communities must share in the responsibility for biosolids management, which includes land application and other recycling methods.

In conclusion, if SB 218, or any one of its provisions are passed, land application in New Hampshire will be eliminated as an environmentally sound and viable management option. Thanking you for this opportunity to provide comments, I am,

Sincerely yours,

Ann A. Bosiak

Ann A. Bosiak
Technical Services Coordinator

cc: S. Toft, B. Angelotti, J. Faust, P. Gratton, G. Lynch, D. Hufman, Bio Gro
H. Veilleux, S&H Murphy

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NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES
Env-Ws 800
Sludge Management

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## CHAPTER Env-Ws 800 SLUDGE MANAGEMENT

Statutory Authority: RSA 485-A:4,XVI-b; RSA 485-A:6,X-a

Readopt with amendment Env-Ws 800, effective 3-19-96(doc.#6205), to read as follows:

## PART Env-Ws 801 PURPOSE AND APPLICABILITY

Env-Ws 801.01 Purpose. These rules establish standards, criteria, and procedures for a permit system to manage the removal, transportation, and disposal of sludge in order to protect human health and the environment, prevent nuisances and to encourage beneficial use and recycling of sludge with appropriate performance standards.

Env-Ws 801.02 Applicability.

(a) These rules shall govern:

(1) The processing and storage of sludge;

(2) The land application of sludge; and

(3) The removal and transportation of sludge derived from human waste which is not class A.

(b) Except for the sludge hauling requirements specified in Env-Ws 805, these rules shall not apply to sludge which is disposed as a waste or otherwise used at a solid waste facility permitted by the waste management division of the department pursuant to RSA 149-M.

(c) Except for the sludge hauling requirements specified in Env-Ws 805, these rules shall not apply to sludge which is disposed in an incinerator permitted by the department.

(d) These rules shall not apply to any sludge management activity(ies) incidental to the operation of a wastewater treatment facility for which a surface water or a groundwater discharge permit has been issued by the department pursuant to RSA.485-A:13.

(e) Nothing in these rules shall be construed to modify or lessen the powers conferred upon local authorities by health and land use enabling statutes.

(f) Nothing in these rules shall be construed to eliminate the need to comply with the federal regulations as specified in 40 CFR part 503.

(g) Except for sludge quality certification and labeling requirements specified in Env-Ws 807 and Env-Ws 810, respectively, these rules shall not apply to class A sludge.

Env-Ws 801.03 Co-Disposal of Wastes. Hazardous waste as defined in RSA 147-A or solid waste as defined in RSA 149-M, except for wood ash certified for use under Env-Wm 3400 and waste derived

products certified for use under Env-Wm 3200, shall not be disposed or processed at a site or facility permitted by these rules.

## PART Env-Ws 802 DEFINITIONS

Env-Ws 802.01 "Abutter" means any person who owns property adjacent to, or across a road, railroad, or stream from the property on which a sludge management activity will be conducted.

Env-Ws 802.02 "Agronomic rate" means the sludge application rate that is designed to:

(a) Provide the amount of nitrogen or other nutrient(s) needed by the crop or vegetation; and

(b) Minimize the amount of nitrogen that passes below the root zone of the crop or the vegetation to the groundwater.

Env-Ws 802.03 "Ambient groundwater quality standards" means "ambient groundwater quality standards" as defined in RSA 485-C:2, I, namely "maximum concentration levels for regulated contaminants in groundwater which result from human operations or activities, as delineated in RSA 485-C:6."

Env-Ws 802.04 "Applicant" means any person who applies to the department for a permit.

Env-Ws 802.05 "Beneficial use" means taking advantage of the nutrient content and/or soil conditioning properties of sludge by supplying agronomic or soil conditioning benefits such as the nitrogen, phosphorus, micronutrients, or organic matter needs for:

(a) A crop;

(b) Forested land; or

(c) Establishing a vegetative cover for reclamation sites.

Env-Ws 802.06 "Class A sludge" means sludge derived from human waste which is class A with respect to pathogens under 40 CFR part 503.32(a) and which meets one of the vector attraction reduction requirements of 40 CFR part 503.33(b)(1) through (b)(8).

Env-Ws 802.07 "Class B sludge" means sludge derived from human waste which is class B with respect to pathogens under 40 CFR part 503.32(b) and which meets one of the vector attraction reduction requirements of 40 CFR part 503.33(b)(1) through (b)(11).

Env-Ws 802.08 "Closure" means the procedures used to cease the use of a facility, or a portion thereof, in a manner that will minimize future risks of environmental damage, and includes all required post-closure inspection, monitoring, and maintenance activities.

Env-Ws 802.09 "CFR" means the code of federal regulations published by the office of the federal register, national archives, and records administration.

Env-Ws 802.10 "Council" means the water council established by RSA 21-O:7.

Env-Ws 802.11 "Department" means the department of environmental services.

Env-Ws 802.12 "Disposal" means the final discharge, deposit, injection, dumping, mixing, spilling, leaking, incinerating, or placing of sludge into or onto any land so that such sludge or any constituent thereof may enter the environment, be emitted into the air or be discharged into any surface water or groundwater. Disposal includes land application.

Env-Ws 802.13 "Facility" means a location or system for storing sludge for longer than 8 months or for the processing, treatment, or disposal of sludge, other than land application. Facilities include, but are not limited to, lagoons, sludge treatment facilities, sludge monofills, sludge transfer stations, and sites where sludge is treated or mixed with other sludge or other material for shipment off site.

Env-Ws 802.14 "Generator" means the person who holds title to the water or wastewater treatment facility that produced the sludge or the facility where sludge is mixed or treated to produce another material.

Env-Ws 802.15 "Governing body" means the board of selectmen in a town, the board of aldermen or council in a city, or town with a town council, or when used to refer to unincorporated towns or unorganized places, or both, the county commissioners.

Env-Ws 802.16 "Hauler" means any person engaged in the removal or transportation of sludge.

Env-Ws 802.17 "In bulk" means a sludge that is distributed in a container of greater than 100 pounds.

Env-Ws 802.18 "Industrial wastewater" means wastewater generated from a commercial or industrial process.

Env-Ws 802.19 "Lagoon" means a pit or excavation designed to receive sludge.

Env-Ws 802.20 "Land application" means the placement of sludge on the ground surface for beneficial use, whether or not the material is incorporated or injected into the soil.

Env-Ws 802.21 "Locally accessible place" means a location, in the town or municipality where the sludge management activity is proposed, that has public access. The term includes the town hall, school building, selectmen's office or the public library.

Env-Ws 802.22 "Management" or "manage" means the practice of supervising, controlling, or undertaking any sludge activity(ies) regulated under these rules, including transporting, land applying, stockpiling, treating or processing.

Env-Ws 802.23 "Operator" means the person responsible for managing the sludge activity(ies) at a site, facility, or wastewater treatment facility.

Env-Ws 802.24 "Owner" means the person who holds title to the land on which sludge is managed or is proposed to be managed.

Env-Ws 802.25 "Permit" means the written document issued by the department which authorizes the holder to manage the site or facility or to use the vehicle to remove and transport sludge according to the terms of the document.

Env-Ws 802.26 "Permit holder" means the person to whom a permit has been issued by the department.

Env-Ws 802.27 "Person" means "person" as defined by RSA 485-A:2,IX, namely "any municipality, governmental subdivision, public or private corporation, individual, partnership, or other entity."

Env-Ws 802.28 "Poorly drained" means a type of soil where water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods. The occurrence of internal free water is shallow or very shallow and common or persistent. Free water is commonly at or near the surface long enough during the growing season so that most mesophytic crops can not be grown, unless the soil is artificially drained. The soil is not continuously wet directly below plow depth. Free water at shallow depth is usually present.

Env-Ws 802.29 "Processing" means any activity to reduce the quantity of sludge or alter its chemical, biological, or physical state. Processing does not include the alteration of a sludge's chemical, biological, or physical state solely for the purpose of odor control.

Env-Ws 802.30 "Publicly owned treatment works (POTW)" means a wastewater treatment facility which is owned by a municipality or other governmental agency or subdivision.

Env-Ws 802.31 "Reclamation" means the addition of organic matter and nutrients to improve and/or promote establishment of vegetation on soils which have been severely disturbed or which are in a poor vegetative state.

Env-Ws 802.32 "Site" means contiguous land areas owned by the same person(s), on which sludge is stockpiled for 8 months or less or land applied, even if the land area is divided by a highway, railroad bed, water body, or boundary of a political subdivision.

Env-Ws 802.33 "Sludge" means "sludge" as defined by RSA 485-A:2,XI-a, namely "the solid or semisolid material produced by water and wastewater treatment processes, excluding domestic septage; provided, however, sludge which is disposed at solid waste facilities permitted by the department shall be considered solid waste and regulated under RSA 149-M." Sludge also includes industrial sludge and sludge mixed with another sludge or another material.

Env-Ws 802.34 "Sludge derived from human waste" means sludge produced by the treatment

of wastewater which contains human fecal material. Sludge is considered to be derived from human waste if any portion of the influent wastewater contains human fecal material.

Env-Ws 802.35 "Stockpiling" means the storage of sludge.

Env-Ws 802.36 "Surface water" means "surface waters of the state" as defined by RSA 485-A:2, XIV, namely "streams, lakes, ponds and tidal waters within the jurisdiction of the state, including all streams, lakes, or ponds bordering on the state, marshes, water courses and other bodies of water, natural or artificial." Surface water includes wetlands, but does not include non-tidal drainage ditches which were designed, built, and used to convey wastewater or stormwater. It also does not include constructed wetlands, lagoons, and other treatment systems designed and built solely as wastewater or stormwater treatment systems provided such facilities were not initially constructed in waters of the state or were not constructed to serve other mitigation purposes.

Env-Ws 802.37 "Transfer" means:

(a) The conveyance of a fee simple interest in real estate; or

(b) A change in the ownership or operational control of a person holding a permit, or a change in an individual holding a permit as follows:

(1) For a partnership, a change in the majority of general partners;

(2) For a corporation, the conveyance of all corporate assets or of a majority of voting shares to a new person;

(3) For other organizations, a transfer of the control of the organization to a new person; and

(4) For an individual, transfer of control to another person.

Env-Ws 802.38 "Vector" means a carrier that is capable of transmitting a pathogen from one organism to another, including but not limited to flies and other insects, rodents, birds, and other vermin.

Env-Ws 802.39 "Very poorly drained" means a type of soil where water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season. The occurrence of internal free water is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. If rainfall is high or nearly continuous, slope gradients can be greater.

Env-Ws 802.40 "Wastewater treatment facility" means a group of devices provided for:

(a) The treatment of domestic or industrial wastewater, or both;

(b) The dewatering of sludge removed from such wastewater;

(c) The treatment of septage; or

(d) Any combination of (a) through (c) above.

## PART Env-Ws 803 REQUIREMENTS FOR NOTIFICATION

Env-Ws 803.01 Notification Requirements for Site and Facility Permits.

(a) The applicant shall provide notice in accordance with this section upon filing an application with the department for a site or facility permit.

(b) The notice shall be provided to:

(1) The governing body of the municipality in which the proposed site or facility is located and the governing body of any adjacent municipality in which an abutter is located;

(2) All abutters to the proposed site or facility as such abutters and their respective legal mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c);

(3) All other landowners within 500 feet of the area on which the activity will occur as such landowners and their respective mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c); and

(4) The department.

(c) The notice shall be:

(1) In writing; and

(2) Delivered by one of the following methods:

a. Sent by certified mail, return receipt requested;

b. Delivered by hand, in which case a signed acknowledgment from the recipient that the notice was received shall be obtained; or

c. Sent by first class mail, in which case a certificate of mailing shall be obtained from the United States post office at which the notices were mailed.

(d) The notice shall contain the following information:

(1) A statement that an application for a site or facility permit, as applicable, has been filed and the type of sludge management activity regulated by Env-Ws 800 that is proposed;

(2) Identification of the proposed site or facility, as applicable, including street address and municipality;

(3) The names, addresses, and telephone numbers of:

a. The applicant;

b. The generators of the sludges that will be managed at the site or facility;

c. The operator at the site or facility; and

d. The owner, and the lessee if the land is leased;

(4) The estimated annual quantity of sludge, in wet tons, to be received at the site or facility;

(5) The proposed dates of commencement and cessation of the activity;

(6) The identification of the locally accessible place where the application, and all supporting information as required under Env-Ws 806.01 for site permits, and under Env-Ws 808.01 for facility permits, are available for review; and

(7) A statement that a local public hearing will be advertised by the department in a newspaper of local circulation and that the department shall hold the public hearing once it has deemed an application to be complete.

(e) If a person to whom notice is required to be given cannot be located, fails, or refuses to sign for the certified mail and/or refuses to sign an acknowledgment when the notice is delivered in hand, the person giving the notice shall provide proof to the department that an attempt to deliver the notice was made, which proof shall be in the form of an affidavit, or a copy of the certificate of mailing submitted to the department with the application.

Env-Ws 803.02 Notification Requirements for Land Application.

(a) A person who will be land applying sludge shall provide notice in accordance with this section at least 14 days before the intended date of the first annual land application.

(b) The notice shall be published in a newspaper of general circulation in the municipality where the land application of sludge will occur and shall include the information required in Env-Ws 803.01(d)(1),(2),(3), and (5).

(c) A copy of the notice shall be posted continually at the entrances to the site beginning no later than 3 days prior to the application and ending no earlier than 3 days after application.

## PART Env-Ws 804 REQUIREMENTS FOR PERMITS

Env-Ws 804.01 Sludge Hauler Permits Required.

(a) Except as provided in (b) and (c) below, no person shall transport sludge derived from human waste which is not class A on public roads without first obtaining a sludge hauler permit from the department.

(b) A sludge hauler permit shall not be required for the interstate transportation of sludge which is not generated, processed, transferred, stored, used, or disposed of in New Hampshire.

(c) A sludge hauler permit shall not be required for transporting sludge from a stockpile location at a permitted site to fields at the same site where the sludge is being land applied.

Env-Ws 804.02 Site and Facility Permits Required.

(a) Except as provided in (e) below, no person shall manage sludge at any place which does not have:

(1) A site or facility permit issued in accordance with Env-Ws 800;

(2) A wastewater treatment facility permit issued under RSA 485-A:13; or

(3) A solid waste facility permit issued under RSA 149-M.

(b) Except as provided in (e) below, a site permit shall be required for:

(1) All sludge land application sites;

(2) All sludge mixing sites where the resultant sludge is to be used on site; and

(3) All sludge stockpile sites where sludge will be stockpiled for 8 months or less and where the stockpile location is not on a site permitted by (1) or (2) above.

(c) Except as provided in (d) below, a facility permit shall be required for:

(1) The processing, treatment, or disposal, other than land application, of sludge;

(2) All sludge mixing sites where the resultant sludge is to be used off-site;

(3) All sludge stockpile sites where sludge will be stockpiled for greater than 8 months;

(4) The construction, operation , and closure of sludge lagoons and monofills; and

(5) The construction, operation, and closure of sludge transfer stations.

(d) A facility permit shall not be required for the processing of sludge for the sole purpose of odor control at a site permitted for land application.

(e) Persons who land apply class A sludge from a generator with a valid sludge quality certification under Env-Ws 807 shall be exempt from the requirement to obtain a site permit.

Env-Ws 804.03 Sludge Quality Certification Required.

(a) Except as provided in (b) and (c) below, no person shall land apply, distribute for land application, sell, or give away any sludge or sludge mixture, in bulk, from any generator that does not possess a valid sludge quality certification pursuant to Env-Ws 807.

(b) A sludge quality certification shall not be required for sludge produced at a facility where each constituent sludge has a sludge quality certification.

(c) A sludge quality certification shall not be required for sludge which is not used for land application.

Env-Ws 804.04 Permit and Sludge Quality Certification Application Review.

(a) Within 30 days of receipt of an application with the appropriate fee for a site permit, a facility permit, a sludge quality certification , or a permit modification pursuant to Env-Ws 804.08(f), the department shall determine if the application is complete.

(b) Upon determination by the department that an application for a site, facility, sludge quality certification, or a permit modification pursuant to Env-Ws 804.08(g) is not complete, the department shall provide written notice to the applicant identifying the deficiencies causing the application to be deemed incomplete.

(c) Upon determination by the department that a site or facility application, or a permit modification application pursuant to Env-Ws 804.08(g) is complete, the department shall:

(1) Provide written notice of completeness to the applicant and the governing body of the municipality(ies) which received notice pursuant to Env-Ws 803.01(b)(1);

(2) Make notice of a public hearing and comment period for the pending permit application in a newspaper of local circulation;

(3) Schedule and hold the hearing no sooner than 30 days after the newspaper notice in (2) above in the municipality in which the activity is proposed to occur; and

(4) Conduct the hearing in accordance with Env-C 203.

(d) The newspaper notice shall contain the following information:

(1) The name and mailing address of the applicant;

(2) The location, date, and the time of public hearing;

(3) The locally accessible place where the application can be reviewed;

(4) The name, address, and telephone number of the person in the department receiving comments;

(5) The type of activity to be conducted;

(6) The proposed location of the site or facility;

(7) The name of the owner; and

(8) The deadline for submission of written comments.

(e) At the hearing:

(1) The applicant shall:

a. Make available 3 copies of the application, site plan, management plan, and, if applicable, the facility plan, the groundwater monitoring plan and the closure plan for the public to review;

b. Make a presentation to the public summarizing all the information required in the application, the site plan, the management plan and, if applicable, the facility plan, the groundwater monitoring plan, and the closure plan; and

c. Respond to all questions concerning the proposed sludge management activity; and

(2) After the applicant has responded to all questions concerning the proposed activity, the department shall:

a. Receive public comments on the application and supporting information as to its accuracy; and

b. Receive all other public comments.

(f) The department shall allow 15 days from the date of the hearing to receive written comments.

(g) Subject to (h) below, within 120 days of receipt of a complete application, the department shall issue or deny the site or facility permit, the sludge quality certification or the permit modification based on the criteria specified in Env-Ws 806.05, Env-Ws 808.05, Env-Ws 807.03, or Env-Ws 804.08, as applicable, and shall send written notice of its decision to the applicant and, in the case of a permit modification or a site or facility permit, to the governing body of the municipality(ies) to which the notice was sent pursuant to Env-Ws 803.01(b)(1).

(h) The time spent waiting for the applicant to provide any requested information shall not be included when calculating the 120 days in (g) above.

(i) If the information submitted with any complete application is insufficient for the department to make a determination that the proposed activity will comply with the applicable requirements of RSA 485-A and these rules, the person proposing to undertake the activity shall provide such additional information as the department determines is necessary to make the determination. If the additional information is not submitted within 60 days of the department's request, the application shall be denied.

(j) If site-specific conditions or limitations are necessary to protect public health or safety or the environment, the department shall include such conditions or limitations in the site or facility permit or sludge quality certification that is issued.

(k) If a permit modification pursuant to Env-Ws 804.08(g), a site or a facility permit, or sludge quality certification is denied, the department shall provide written notification to the applicant and, in the case of a permit modification or a site or facility permit application, the municipality identified in Env-Ws 803.01(b) noting the appropriate sections of the rules and stating the specific reasons for the denial, and shall inform the applicant that the decision may be appealed to the water council in accordance with RSA 21-O:7.

Env-Ws 804.05 Suspension, Revocation or Refusal to Renew.

(a) If after issuing a permit or a sludge quality certification the department receives information which indicates that good cause, as set forth in (f) below, exists to suspend or revoke the permit or certification, the department shall proceed in accordance with Env-C 200.

(b) After proceeding in accordance with Env-C 200, the department shall revoke the permit or sludge quality certification if the department determines that the reason for good cause cannot be corrected to conform to applicable requirements.

(c) After proceeding in accordance with Env-C 200, the department shall suspend the permit or sludge quality certification, subject to (d) below, if the department determines that, while good cause exists, the reason that good cause exists can be corrected to conform to applicable requirements.

(d) If a permit or sludge quality certification is suspended pursuant to (c) above, the department shall not reinstate the permit or certification until:

(1) The reason for good cause has been corrected to conform with applicable requirements; and

(2) The permittee submits a written request to the department requesting that the permit or sludge quality certification be reinstated.

(e) If after receiving a request for renewal of a permit or sludge quality certification the department receives information which indicates that good cause, as set forth in (f) below, exists to refuse to renew the permit or certification, the department shall proceed in accordance with Env-C

200 and refuse to renew the permit or sludge quality certification until the reason for good cause has been corrected to conform with applicable requirements.

(f) Good cause to revoke or refuse to renew a permit or sludge quality certification shall include the following:

(1) The permit or sludge quality certificate holder has not complied with the conditions of the permit or these rules;

(2) The plans submitted with the application do not accurately portray the actual site, facility, or management activities;

(3) Any other information submitted in support of the application is not true and complete or is misleading;

(4) The permit or sludge quality certificate holder has failed to comply with an order of the department relative to sludge management, including an order to undertake corrective measures;

(5) The permit or sludge quality certificate holder has failed to comply with an order of the department relative to a violation of any other statute administered by the department; or

(6) The permit or sludge quality certificate holder has failed to pay any administrative, civil, or criminal penalties owed to the department.

Env-Ws 804.06 Permit Transfer.

(a) A sludge hauler permit shall be issued to the applicant for the vehicles identified in the application and shall not be transferred by the permit holder to any other person unless prior approval is obtained from the department in accordance with (c) through (e) below.

(b) A site or facility permit shall be issued to the applicant and shall not be transferred by the permit holder to any other person unless prior approval is obtained from the department in accordance with (c) through (e) below.

(c) The person wishing to transfer a permit shall submit to the department:

(1) A copy of the original application;

(2) A copy of the permit;

(3) The name, address and telephone number of the person(s) to whom the permit will be transferred; and

(4) An application for a permit modification pursuant to Env-Ws 804.08(b) and (c) for any changes that are proposed to the permit, the site plan, the facility plan, closure plan,

or the management plans, as applicable.

(d) The person to whom the permit is proposed to be transferred shall submit a statement declaring whether the person has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application or of a felony in any state or federal court within the 10 years prior to the date of application.

(e) The department shall approve such transfer if:

(1) The permit holder is in compliance with these rules and the permit;

(2) Any proposed changes are in accordance with Env-Ws 804.08;

(3) Good cause as defined by Env-Ws 804.05(f) to suspend, revoke, or refuse to renew the permit does not exist, unless the reason that good cause exists can be corrected prior to or as a result of the permit transfer; and

(4) The person to whom the permit is proposed to be transferred has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court within the 10 years prior to the date of application.

Env-Ws 804.07 Transfer of Land Ownership.

(a) If land that has a facility or site permit associated with it is transferred to a new owner, then the permit holder shall notify the department within 10 days of the transfer and shall suspend all activities covered by the permit until the statement described in (c) below is signed by the new property owner and is received by the department.

(b) If a signed statement as described in (c) below does not accompany the notice of land transfer, then upon receipt of the notice the department shall commence a proceeding under Env-C 200 to revoke the permit. If the permit holder obtains and submits the signed statement the proceeding shall be terminated.

(c) The statement from the new owner shall state that:

(1) The new owner is aware that the site or facility exists on the land;

(2) The new owner agrees to the continued operation of the site or facility; and

(3) The new owner has given permission to the permit holder to enter upon the land for purposes of investigation and operation, including the implementation of remedial measures if ordered by the department.

(d) If the new owner chooses to discontinue the activities covered by the site or facility permit, the permit holder shall:

(1) Submit a written statement to the department indicating that the activities have been discontinued;

(2) Remove any infrastructure specific to the activities that were subject to the permit; and

(3) If a facility, close the facility in accordance with the approved closure plan.

Env-Ws 804.08 Modification for Site or Facility Permits.

(a) The department shall modify the conditions of a permit without request by the permit holder in order to achieve compliance with these rules.

(b) In the event of any such modification the department shall:

(1) Provide written notice to the permit holder stating the proposed modifications and the reason(s) for the modification(s);

(2) Provide the permit holder 30 days from the date of the written notice to comment in writing on the proposed permit modification(s);

(3) After considering the permit holder's written comments, if any, issue a revised permit with a timetable for bringing the permit holder's activities into compliance with the revised conditions of the permit; and

(4) Notify the permit holder that he/she may request an adjudicatory hearing in accordance with Env-C 200 if aggrieved by the department's decision.

(c) The permit holder shall apply to the department to renew a site or facility permit, to modify a site or facility permit or to modify any permitted management activity prior to implementing any changes.

(d) The permit holder shall provide the following information to the department:

(1) The site or facility permit number;

(2) The name, address, and telephone number of the permit holder, owner, operator, and generator;

(3) A detailed description of all proposed modifications;

(4) A revised site, facility, management or closure plan highlighting the proposed changes;

(5) If applicable, revised facility plans and specifications for construction and closure stamped by a New Hampshire registered professional engineer;

(6) An explanation of why the proposed change(s) is necessary or desirable;

(7) The effect of the modification on the site's or facility's capacity and life expectancy and service area;

(8) Identification and status of all other federal or state permits or approvals necessary to effect the proposed modification(s);

(9) The permit holder's proposed schedule for implementing such changes;

(10) A list and status of any outstanding violations, accompanied by a statement from the permit holder indicating how full compliance shall be attained prior to approval of the modification; and

(11) A list of any current abutters to whom the notice was not provided at the time of the original application.

(e) The department shall approve the modification if it determines that:

(1) All applicable requirements of these rules have been met;

(2) If the applicant is other than the owner, the owner has given permission to the applicant for the modification;

(3) All other state permits which are necessary for the proposed modification have been applied for;

(4) Management of the sludge at the site or facility in accordance with the proposed modification will not violate any statutes or rules administered by the department; and

(5) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department.

(f) Subject to (g) below, applications to modify a permit shall be approved or denied within 30 days of receipt of the information required in (d) above.

(g) If the proposed permit modification increases the quantity of sludge being managed at the site or facility by more than 20% from the quantity specified in the current permit , the modification shall be processed in accordance with Env-Ws 803 and Env-Ws 804.04.

## PART Env-Ws 805 SLUDGE HAULER PERMIT REQUIREMENTS

Env-Ws 805.01 Sludge Hauler Permit Applications.

(a) Any applicant for a permit to remove or transport sludge derived from human waste which is not class A on public roads shall provide the following information on a form obtained from the department:

(1) The name, address, and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone numbers of the applicant's business and contact person;

(3) Any telephone numbers to be used in case of emergency;

(4) The vehicle identification number and license plate number for each vehicle which will be used to transport containers carrying sludge;

(5) The name, principal place of business, and telephone number of the sludge transporting company that will appear on both sides of the vehicle, which will be used to transport the container(s) carrying the sludge, unless identified pursuant to Env-Ws 805.06(d); and

(6) Whether the applicant or owner has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application.

(b) Each application shall be accompanied by the fee specified in Env-Ws 805.04.

(c) Each application shall be accompanied by a certification that upon issuance of the permit, the applicant shall assume complete responsibility for ensuring that all persons who will be transporting sludge with the applicant's vehicle(s) are familiar with the requirements of these rules.

(d) Each application shall be accompanied by a statement signed by the applicant stating that all vehicles and container(s) proposed to be used to transport sludge have met all applicable federal and state requirements for sludge transportation.

Env-Ws 805.02 Expiration of Sludge Hauler Permits. Sludge hauler permits issued after January 1, 1999, shall have a duration of 2 years or less and shall expire on January 31 of the odd numbered year following the date of issuance.

Env-Ws 805.03 Renewal of Sludge Hauler Permits. Any person to whom a sludge hauler permit has been issued, and who wishes to renew the permit, shall submit the information required in Env-Ws 805.01 and the permit fee specified in Env-Ws 805.04 to the department not less than 30 days prior to expiration of the permit.

Env-Ws 805.04 Sludge Hauler Permit Fee.

(a) A fee in the amount of $100 for each vehicle used to carry sludge shall accompany each application for issuance or renewal of a sludge hauler permit. If vehicles are replaced or added by the hauler, the hauler shall provide all required registration information to the department along with the additional fee for each vehicle to be added.

(b) The fee, if paid by check or money order, shall be made payable to "Treasurer-State of NH."

(c) The fee shall not be prorated or refunded if the permit term established pursuant to Env-Ws 805.02 is less than a full 2 years.

(d) Any municipality that transports its own sludge shall be exempt from the fee specified above.

Env-Ws 805.05 Criteria for Review. The department shall issue or renew a sludge hauler permit, within 30 days of receipt of the information required in Env-Ws 805.01, for the vehicle(s) specified in the application, if it determines that the following criteria have been met:

(a) All applicable requirements of these rules have been met;

(b) The applicant submits a signed statement stating that all vehicles and containers, proposed to transport sludge comply with all applicable, federal and state requirements required for sludge transportation;

(c) The applicant has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application; and

(d) The applicant has paid all fees and administrative, civil, or criminal penalties owed to the department.

Env-Ws 805.06 Identification of Vehicle(s).

(a) A copy of the sludge hauler permit shall be retained in the vehicle at all times.

(b) Each sludge hauler shall display the name, principal place of business, and telephone number of the hauler or transporting company on both sides of the vehicles, used to transport sludge, unless exempt pursuant to (d) below.

(c) The information required by in (b) above shall be in permanent and legible lettering at least 3 inches high.

(d) Municipal vehicles which bear the municipal seal on each side of the vehicle shall not need further identification.

(e) Labeling of containers shall be required when transporting class B sludge. This labeling shall be legible, visible and mounted curbside in 3 inch tall lettering and shall read "class B sludge."

Env-Ws 805.07 Maintenance of Containers and Vehicles. Any hauler who has been issued a permit pursuant to Env-Ws 805 shall maintain all containers and vehicles used to transport sludge, in accordance with the following:

(a) Each container and vehicle shall be maintained so as not to create unreasonable malodors or public health hazards;

(b) Each container transporting sludge from which free water might be released during transport shall be watertight;

(c) All piping, valves, and rigid or flexible connections shall be accessible and capable of being cleaned;

(d) All inlet and outlet connections shall be constructed and maintained such that no material will leak, spill, or run out of the container during transfer or transportation; and

(e) Discharge outlets shall be designed to control the flow of discharge without spraying or flooding the receiving area.

Env-Ws 805.08 Transportation of Sludge.

(a) Sludge, derived from human waste which is not class A, being transported to a land application or stockpile site shall meet class B requirements.

(b) All sludge shall receive a sludge quality certification in accordance with Env-Ws 807 prior to being transported to a site permitted under these rules.

(c) All containers used for transporting sludge shall be covered during transport to minimize odors.

(d) Containers transporting sludge shall not be placed for longer than 24 hours at a place that does not have a site or facility permit.

(e) All containers shall be inspected by the driver prior to transport on public roads to ensure that sludge will not leak, spill, or run out of the container during transfer or transportation.

(f) All vehicles and containers used to transport sludge shall conform to all applicable federal and state requirements for sludge transportation.

Env-Ws 805.09 Change of Vehicles. Whenever a permit holder obtains an additional or replacement vehicle, for transporting the containers, the permit holder shall:

(a) Notify the department in writing prior to placing the vehicle in service to transport sludge;

(b) Supply the identification number and license plate number for the vehicle(s); and

(c) Submit the additional fee, if required under Env-Ws 805.04.

Env-Ws 805.10 Record keeping.

(a) Each sludge hauler permit holder shall record the following information, on a form provided by the department, for each load of sludge:

(1) The date the sludge is transported from the generator's site or facility;

(2) The generator'(s) name, address, and telephone number;

(3) The quantity of sludge, in wet tons;

(4) The type of sludge, such as domestic or industrial;

(5) The name, address, and telephone number of the hauler permit holder and driver of the motorized vehicle;

(6) The name, address, and telephone number of the site(s), facility(ies), solid waste facility(ies), or wastewater treatment facility to which the sludge is to be delivered; and

(7) The date delivered to the site or facility.

(b) The information required in (a) above shall be maintained in the vehicle used to transport the sludge when the sludge is being transported.

(c) Records shall be maintained for a minimum of 5 years after expiration of the hauler permit.

Env-Ws 805.11 Reporting. Each hauler shall provide the information required by Env-Ws 805.10(a) monthly to the operator of the site, facility, solid waste facility or wastewater treatment facility, to which the sludge is delivered by no later than the 15th of the following month.

Env-Ws 805.12 Accidental Release.

(a) In the event of an accidental release of sludge, the permit holder shall:

(1) Immediately take action to contain the spill, minimize the environmental impact, and begin clean up procedures;

(2) Subject to (b) below, notify the department within 24 hours of the release with the following information:

a. The date, time and location of the spill;

b. The quantity of sludge spilled and the quantity of sludge recovered, in wet tons;

c. The quantity and final disposition of any sludge that was not recovered;

d. The hauler's permit number and the name and telephone number of the driver involved in the incident;

e. The name and telephone number of the generator;

f. The approximate distance to any surface waters and storm drains within 100 feet of the spill;

g. The actions taken to control the extent of the spill and minimize the environmental impact; and

h. Future actions necessary to clean up the spill, if applicable.

(b) Notification to the department shall not be required if all of the following conditions are met:

(1) The discharge is less than 25 gallons or 5 cubic feet if the sludge contains greater than 10 percent solids;

(2) The discharge is immediately contained;

(3) The discharge is completely removed within 24 hours; and

(4) There is no impact to groundwater or surface water.

**PART Env-Ws 806 SITE PERMIT REQUIREMENTS**

Env-Ws 806.01 Site Permit Applications.

(a) The person proposing to undertake the sludge management activities at the site shall apply for the site permit.

(b) The applicant shall provide the following information on a form obtained from the department:

(1) The name, address, and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone number of the applicant's business;

(3) The name and telephone number of the person who can be reached 24 hours a day in case of an emergency;

(4) The location of the proposed site, including street address, tax map and lot number, and current deed reference;

(5) The site owner's name, address, and telephone number;

(6) The name, mailing address, and telephone numbers of each operator of the site, including each person's responsibility as it pertains to the regulated activities;

(7) The type(s) of land application activity(ies) being proposed for the site, including but

not limited to agricultural land application, forest application, reclamation, or stockpiling;

(8) A description of the use of the site, including agricultural operations and crops grown on each field, if applicable, covering 5 years immediately prior to submission of the application; and

(9) Whether the applicant has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application or of a felony in any state or federal court during the 10 years prior to the date of application.

(c) The following shall be submitted with the application:

(1) The site plan prepared in accordance with Env-Ws 806.06, and a copy which has been reduced to a size of 8½ X 11 inches or 11 X 14 inches;

(2) The management plan prepared in accordance with Env-Ws 806.07;

(3) If reclamation is proposed, the groundwater monitoring plan required in Env-Ws 809.02;

(4) A statement signed by the applicant certifying:

a. Compliance with the notification provisions of Env-Ws 803.01;

b. That all operators of the site will be instructed on the requirements of Env-Ws 800 prior to working at the site;

c. That a copy of the application has been given to the governing body of the municipality in which the activity is proposed to occur; and

d. That the information submitted is accurate;

(5) A copy of the Natural Resource Conservation Service county soils survey map, or portion thereof, with the area(s) of proposed activity clearly delineated, including a description of each soil type found on the site;

(6) The description of the soil profile characteristics of each soil test pit or auger boring as required in Env-Ws 806.10(c);

(7) An original of the most recent USGS map, largest scale available, with the latitude and longitude specified, showing the approximate location and boundaries of the site;

(8) The results of the soil analyses conducted in accordance with Env-Ws 806.10;

(9) Written verification from the department of resources and economic development indicating whether or not threatened or endangered species exist on the site;

(10) For all reclamation sites and forest application sites, a site-specific soil map or survey prepared in accordance with the Site-Specific Soil Mapping Standards for New Hampshire and Vermont, Society of Soil Scientists of Northern New England Publication No. 3, dated June 1998;

(11) A list of all other state permits which are required for the proposed site and evidence that applications for those permits have been submitted; and

(12) The name and address of the locally accessible place where all information required in Env-Ws 806.01 can be reviewed.

(d) If the applicant is not the owner, the application shall be accompanied by a written statement in accordance with (e) below, and signed by the owner.

(e) The written statement shall say that the owner is aware that the application is being filed and has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the sludge land application or stockpile site in the event that the department issues the permit.

(f) If the applicant is not the generator of the sludge(s), the application shall be accompanied by a written statement signed by each generator stating that the generator is ultimately responsible for ensuring that the final disposition of the material is performed in accordance with these rules and 40 CFR part 503.

(g) Each application shall be:

(1) Signed by the applicant;

(2) Submitted in duplicate; and

(3) Accompanied by the fee specified in Env-Ws 806.04.

Env-Ws 806.02 Expiration of Site Permits.

(a) Except as provided in (c) below, a site permit issued by the department shall expire 5 years from the date on which it was issued.

(b) Any person land applying or stockpiling sludge at a site which previously did not require a permit under Env-Ws 800 shall:

(1) Within 90 days from the effective date of the 1999 amendments to Env-Ws 800, comply with all applicable provisions of Env-Ws 800 other than notification and permitting; and

(2) Within 120 days of the effective date of the 1999 amendments to Env-Ws 800,

submit an updated site plan and management plan.

(c) A site permit issued by the department for land application of a sludge which is certified as a low metals sludge under Env-Ws 807.03(h) shall expire 10 years from the date on which it was issued.

Env-Ws 806.03 Renewal of Site Permits. Any person to whom a site permit has been issued who wishes to renew the permit shall apply for a permit modification under Env-Ws 804.08(c) and submit the permit fee required in Env-Ws 806.04 to the department no later than 120 days prior to expiration of the permit.

Env-Ws 806.04 Permit Fees.

(a) A fee in the amount of $300 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with greater than 10 acres.

(b) A fee in the amount of $150 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with greater than 5 but less than or equal to 10 acres.

(c) A fee in the amount of $100 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with 5 or fewer acres.

(d) Fees, if paid by check or money order, shall be made payable to "Treasurer-State of NH."

(e) Sites where only sludge from New Hampshire municipalities is land applied shall be exempt from the fees specified in (a) through (c) above.

Env-Ws 806.05 Criteria for Review. The department shall issue a site permit if it determines that:

(a) All applicable requirements of these rules have been met;

(b) If the applicant is other than the owner, the owner has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the site in the event that the department issues the permit;

(c) All other state permits which are necessary for the operation of the site have been applied for;

(d) Management of sludge at the site in accordance with the application will not violate any statutes or rules implemented by the department;

(e) The permit holder has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application;

(f) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department;

(g) The permit holder has submitted all test results and reports required for a site permit pursuant to Env-Ws 806.01; and

(h) The proposed use of sludge will not adversely affect threatened or endangered species.

Env-Ws 806.06 Site Plans. Site plans required under Env-Ws 806.01(c)(1) shall be based upon a municipal tax map, a surveyed plan, or other scaled drawing which:

(a) Identifies the proposed site location at a scale appropriate to delineate the information clearly; and

(b) Shall be marked to show:

(1) A locus map which identifies the proposed site location at a scale appropriate to delineate the information clearly;

(2) The total land area, in acres, to be used for land application;

(3) The land area of each field, in acres, identified by unique field designation(s) and corresponding crop(s) proposed to be grown;

(4) The identification of access roads, access control measures, and buffer distances;

(5) The proposed stockpile or storage tank location(s);

(6) The identification of any easements which exist on the property;

(7) The identification of proposed measures to control surface water runoff to or from the site and stockpile locations, if applicable;

(8) The identification of surrounding land use, roads, and property lines within 500 feet of the site;

(9) All soil test pit and auger boring locations;

(10) The approximate location of and distance to all dwellings, structures, and water supply wells within 500 feet of the site;

(11) The names and addresses of all abutters;

(12) The name and location of all surface waters within 500 feet of the site, including their designated river classification under RSA 483, New Hampshire rivers management and protection program, if applicable;

(13) The scale of the plan;

(14) An arrow indicating which direction on the plan is north;

(15) The approximate location of all poorly and very poorly drained soils on the site; and

(16) If reclamation is proposed, the items required in the groundwater monitoring plan specified in Env-Ws 809.02(b).

Env-Ws 806.07 Management Plans. Each management plan required under Env-Ws 806.01(c)(2) shall include the following:

(a) The normal hours of operation of the site;

(b) Proposed route(s) of access to the site;

(c) The method of application, if land applying;

(d) Stockpiling management provisions, if applicable;

(e) The name of the generator(s) and its corresponding sludge quality certification number(s) for any sludge which will be received at the site;

(f) The quantity of sludge, in wet tons, expected on a periodic basis, such as daily, weekly or monthly, and the estimated annual tonnage;

(g) The quantity of sludge, in wet tons, expected over the entire life expectancy of the site;

(h) A description of all sludge mixing activities which are proposed for the site;

(i) A description of the record keeping procedures;

(j) A detailed odor control plan explaining:

(1) The procedures that shall be used to address and resolve any odor complaints;

(2) The name, address, and telephone number of the person(s) who shall be responsible for responding to odor complaints; and

(3) Site management techniques that shall be employed to minimize odors;

(k) A nutrient management plan, for the final sludge mixture to be land applied for each field, specific for each crop or vegetation type, containing the following information:

(1) The crops or vegetation to be grown;

(2) A copy of the farm or site nutrient management recommendations developed in accordance with guidelines of UNH cooperative extension, USDA, NH department of

agriculture, NRCS or other certified agricultural or crop advisors;

(3) The agronomic rate calculations for land application of sludge on agricultural lands, performed in accordance with the "Best Management Practices: Biosolids" published by the UNH cooperative extension, and based on the nutrient content of the sludge or sludge mixture that is proposed to be land applied, unless sludge or sludge mixture specific data, obtained by a qualified professional, and/or site-specific crop yields or production records are available for agronomic rate and crop fertilization determinations;

(4) The agronomic rate calculations for land application of sludge on forested land or for reclamation, performed in consultation with UNH cooperative extension ,USDA, NH department of agriculture, NRCS or other certified agricultural or crop advisors;

(5) The proposed disposition of crops grown;

(6) The proposed type and amount of all other soil amendments and nutrient sources to be used on the site;

(7) The proposed annual nitrogen loading and, except for sites where only sludge certified as low metals is applied, the annual metals loading calculations; and

(8) Except for sites where only sludge certified as low metals is applied, calculation of the cumulative metals' loading to date; and

(l) Any other best management practice(s) which shall be implemented at the site to ensure compliance with these rules.

Env-Ws 806.08 Land Application Standards.

(a) Sludge shall be land applied at rates that conform to the approved nutrient management plan for the site permit pursuant to Env-Ws 806.07(k) and Env-Ws 806.12(a)(5)

(b) No spreading of sludge shall be done on frozen or snow-covered ground or when the ground is saturated due to precipitation or flooding.

(c) No sludge shall be spread on agricultural land which has a slope greater than 15 percent, that is, a 15 foot rise in 100 feet.

(d) Sludge spread on agricultural land which has a slope greater than 8 percent shall contain a minimum of 15 percent solids or be subsurface injected.

(e) Sludge shall be spread in an even layer so as not to result in ponding or runoff of material.

(f) Sludge which is to be land applied shall be processed to minimize visible or identifiable plastics or other non-biodegradable solids.

(g) No spreading of sludge shall be done on very poorly drained soils.

(h) No spreading of sludge shall be done in the floodway, defined as the stream channel plus that portion of the overbanks that must be kept free from encroachment in order to discharge the one percent annual chance flood without increasing flood levels by more than one foot, which is adopted into a local floodplain management ordinance.

(i) Animals shall not be grazed on land on which sludge has been land applied until 45 days after the last application of sludge unless methods to reduce adherence to the crop or vegetation are used in conformance with the approved management plan.

(j) Unless otherwise required by RSA 483, New Hampshire rivers management and protection program, sludge shall be incorporated into the soil within 48 hours of spreading unless it is used for top dressing.

(k) Reclamation and forest sites shall be posted, for the life of the permit, with signs which:

(1) Contain the name and telephone number of the operator;

(2) State "This is a sludge land application site";

(3) Are printed with block letters no less than 2 inches in height, and with the name and address of the owner or lessee of the property; and

(4) Are posted not more than 100 yards apart on all sides and shall also be posted at gates, bars, and commonly used entrances.

(l) Except for sites where only sludge certified as low metals is applied, all sludge and mixtures of sludge to be land applied shall not exceed any of the following lifetime cumulative pollutant loading rates:

(1) For arsenic, 10 kilograms per hectare or 9 pounds per acre;

(2) For cadmium, 5 kilograms per hectare or 4.5 pounds per acre;

(3) For chromium, 300 kilograms per hectare or 268 pounds per acre;

(4) For copper, 300 kilograms per hectare or 268 pounds per acre;

(5) For lead, 200 kilograms per hectare or 178.6 pounds per acre;

(6) For mercury, 5.6 kilograms per hectare or 5.0 pounds per acre;

(7) For molybdenum, 18 kilograms per hectare or 16 pounds per acre;

(8) For nickel, 100 kilograms per hectare or 89.3 pounds per acre;

(9) For selenium, 100 kilograms per hectare or 89 pounds per acre; and

(10) For zinc, 500 kilograms per hectare or 446.5 pounds per acre.

(m) For sludge not generated in New Hampshire, the rate of sludge application shall conform to the application rate allowed by the state of origin or Env-Ws 800, whichever results in the lower loading rate.

(n) For sludge not generated in New Hampshire, groundwater monitoring in accordance with Env-Ws 809 shall be required for sludge management activities which would require groundwater monitoring in the state of origin.

(o) No person shall land apply or store sludge within the buffer areas specified in Table 806-I, subject to (p) below:

TABLE 806-I
Buffer Distances (in feet)

For Land Application:

| | |
|---|---|
| Surface Water | 125[a] |
| Non-tidal Drainage Ditch | 33 |
| Community Wells[b] | 400 |
| Other Wells | 300 |
| Surface Drinking Water Source | 500 |
| Property Lines | 100[c] |
| Public Roads other than Federal Interstate Highways | 25 |
| Federal Interstate Highways | 10 |
| On-site Occupied Dwelling | 100 |
| Off-site Occupied Dwelling: | |
| If used for top dressing | 500[d] |
| If incorporated within 48 hours | 200[d] |
| Bedrock / Restrictive Layer | 2 |
| Groundwater Depth: | |
| Reclamation | 4[e] |
| Land Application | 2[e] |

For Stockpiling or Storage:

| | |
|---|---|
| Surface Drinking Water Source | 500 |
| Nearest Occupied Dwelling | 500[f] |
| Nearest Well | 500[g] |
| Property Line | 100[c] |
| Bedrock / Restrictive Layer | 4 |
| Groundwater Depth | 2[i] |
| Surface water | 250[h] |

| | |
|---|---|
| Non-tidal Drainage Ditch | 100 |

(p) The following shall apply to Table 806-I:

(1) Unless otherwise required by RSA 483, New Hampshire rivers management and protection program, the letter "a" shall indicate that the distance to surface waters may be reduced from 125 feet to 75 feet if the material is incorporated within 48 hours and the slope is less than 8 percent.

(2) The letter "b" shall indicate those community public water supply wells which withdraw greater than 57,600 gallons over a 24-hour period.

(3) The letter "c" shall indicate that the distance to property lines may be reduced through written agreement with affected party(ies).

(4) The letter "d" shall indicate that the distance to an off-site occupied dwelling may be reduced to 100 feet through written agreement with affected parties.

(5) The letter "e" shall indicate that this shall be the distance to the groundwater at the time of application of sludge.

(6) The letter "f" shall indicate that the distance to the nearest occupied dwelling shall be as far as practical beyond 500 feet, but can may be reduced below 500 feet with the occupant's prior written consent.

(7) The letter "g" shall indicate that the distance to the nearest well shall be as far as practical, but in no case closer than 500 feet.

(8) The letter "h" shall indicate that the distance to surface water may be reduced to 125 feet if the slope of the land to the surface water is less than 5% and a vegetated buffer strip of at least 25 feet is maintained between the stockpile and the surface water.

(9) The letter "i" shall indicate that the distance is to the seasonal high water table.

Env-Ws 806.09 Sludge Stockpiling.

(a) Any person stockpiling sludge for longer than 7 days shall cover the stockpile with an odor control material, such as lime, wood ash which has been approved for such use pursuant to Env-Wm 3400, or cement kiln dust, to minimize odors.

(b) Stockpiles of sludge shall be maintained to minimize surface water run-on and run-off.

(c) Stockpiling of sludge shall not be permitted for greater than 48 hours on the 100-year flood plain as defined and delineated by the flood insurance rate maps published by the US Department of Housing and Urban Development or the Federal Emergency Management Agency.

(d) Stockpiling of sludge shall not be permitted on any poorly or very poorly drained soils.

Env-Ws 806.10 Testing.

(a) One soil test pit or auger boring shall be taken, at a depth of at least 40 inches, for each soil mapping unit present on the Natural Resource Conservation Service county soils map, but no less than one every 5 acres.

(b) One soil test pit or auger boring shall be taken, at a depth of at least 4 feet, for each area proposed for stockpiling.

(c) An analysis of the soil test pits or auger borings required in (a) and (b) above shall be performed and shall include a description of the soil profile characteristics, depth to seasonal high watertable, and depth to bedrock or other restrictive layer.

(d) Soil samples from each field proposed to be used for the land application of sludge, shall be collected within 6 months prior to submittal of the permit application.

(e) Soil samples, from each field upon which sludge has been applied, shall be collected within 3 months prior to the end of the permit term or at the cessation of land application.

(f) The soil samples in (d) and (e) above shall be analyzed by a laboratory certified to analyze water for metals, under Env-C 300 for the following constituents:

(1) Arsenic, measured as mg/kg;

(2) Cadmium, measured as mg/kg;

(3) Chromium, measured as mg/kg;

(4) Copper, measured as mg/kg;

(5) Lead, measured as mg/kg;

(6) Mercury, measured as mg/kg;

(7) Molybdenum, measured as mg/kg;

(8) Nickel, measured as mg/kg;

(9) Selenium, measured as mg/kg; and

(10) Zinc, measured as mg/kg.

(g) Soil samples from each field used for sludge land application shall be collected on a yearly basis no more than 90 days prior to the initial application for that year and analyzed by UNH

analytical services, or by a laboratory using a method that produces similar results to those produced by UNH analytical services, for:

(1) Soil acidity, measured as pH;

(2) Buffer pH;

(3) Texture;

(4) Calcium;

(5) Magnesium;

(6) Potassium;

(7) Phosphorus; and

(8) Organic matter.

Env-Ws 806.11 Record keeping.

(a) Every site permit holder shall maintain records of each load of sludge received at the site, including identification of:

(1) The date received;

(2) The name of the hauler delivering the load;

(3) The generator and quantity of each load of sludge received, in wet tons, and percent solids;

(4) The sludge quality certification number(s); and

(5) The date land applied and the amount spread on each field.

(b) Except for sites where only sludge certified as low metals sludge is applied, every site permit holder shall maintain records of the annual and cumulative metal loadings for the site on a field by field basis. In the calculation of annual metals loadings, the permit holder shall use the highest concentration of each metal observed on a dry weight basis, based on testing performed by the generator(s) during the previous 12 months.

(c) Site plans, management plans, and records shall be maintained by the permit holder, and shall be available to the department for review during business hours. If the department believes that violations of RSA 485-A or these rules relative to sludge management have occurred, the department shall require the permit holder to submit copies of all records.

(d) Site plans, management plans, and records shall be maintained for a minimum of 5 years after the expiration of the permit(s) to which they relate.

Env-Ws 806.12 Reporting.

(a) At least 14 days prior to commencement of each yearly sludge land application activity, the permit holder shall submit the following information to the department for each site:

(1) The site name and address;

(2) The name of permit holder;

(3) The sludge quality certification numbers of the sludge(s) to be land applied;

(4) The permit number for the site; and

(5) An updated nutrient management plan as provided in Env-Ws 806.07(k).

(b) Every site permit holder shall submit an annual report for each site to the department by the last business day of January for each calendar year in which the permit is valid, regardless of whether or not the site received or processed sludge during the previous calendar year.

(c) The annual report shall contain the following information:

(1) The site location, including address and town;

(2) The permit number;

(3) The owner's name;

(4) The crops grown for each field and the crop disposition;

(5) The name and sludge quality certification number, if applicable, of each generator;

(6) The quantity of sludge, in wet and dry tons, applied to each field, from each generator;

(7) The total quantity of sludge, in wet and dry tons, applied to the entire site, from each generator;

(8) Except for sites where only sludge certified as low metals sludge is applied, the annual metals' loading and cumulative metals' loading to date for each field; and

(9) For reclamation sites, the groundwater monitoring report.

(d) If any of the information differs from that previously supplied to the department concerning the activity, the permit holder shall note those differences in the annual report.

## PART Env-Ws 807 SLUDGE QUALITY CERTIFICATION REQUIREMENTS

Env-Ws 807.01 Sludge Quality Certification Application. To apply for the sludge quality certification, the generator shall provide the following information:

(a) The name and address of the wastewater treatment facility or facility which has generated or will generate the sludge;

(b) The name, title, and telephone number of the operator of the treatment facility;

(c) For POTWs, a list and brief description of all industrial permittees and the permittee's limits, including a table containing the estimated quantity and physical and chemical characteristics of each discharge and the specific concentration limits in the permit for parameters reasonably expected to be present, being the information required to be maintained by POTWs for industrial discharges under Env-Ws 405.04(c);

(d) For industrial wastewater treatment facilities, the name and quantity of all chemicals being discharged to their treatment facilities, or for those facilities with a NPDES permit, a copy of the most recent NPDES permit application with a statement that the information is current;

(e) The quantity of sludge, in wet tons, generated monthly by the treatment facility for the last 2 years;

(f) If the sludge is not generated in New Hampshire, certification that the sludge meets the chemical standards for land application in the state of origin;

(g) If the sludge contains human waste, a description of the process to achieve class A or class B pathogen reduction requirements and vector attraction reduction requirements, including the applicable 40 CFR part 503 citation; and

(h) A sludge quality report which includes the following:

(1) A description of the treatment facility and sludge treatment process;

(2) A chronological summary of analytical data from the previous 3 years, if available, for each detected chemical, presented in accordance with (3) below;

(3) Data presented in tabular form and categorically for metals, volatile organic compounds, semi-volatile organic compounds, dioxins, and pesticides/herbicides; and

( 4) The results of testing required in Env-Ws 807.05(d), including laboratory reports, presented categorically as in (2) above.

Env-Ws 807.02 Sludge Quality Certification Fees.

(a) Each application shall be submitted in duplicate and shall be accompanied by a fee in the

amount of $1,000.

(b) Fees, if paid by check or money order, shall be made payable to "Treasurer-State of New Hampshire."

(c) Municipalities whose facilities are permitted by the department under RSA 485-A:13 shall be exempt from the fee specified in (a) above.

Env-Ws 807.03 Criteria for Review. The department shall issue a sludge quality certification to the wastewater treatment facility generating the sludge or the facility processing or treating sludge, if it determines that the information submitted demonstrates that the sludge:

(a) Is not a hazardous waste as defined in RSA 147-A:2,VII;

(b) If derived from human waste, consistently meets the pathogen and vector attraction requirements specified in the application;

(c) Does not exceed the following concentrations, expressed as the total concentration on a dry weight basis:

(1) For arsenic, 32 mg/kg;

(2) For cadmium, 14 mg/kg;

(3) For chromium, 1000 mg/kg;

(4) For copper, 1500 mg/kg;

(5) For lead, 300 mg/kg;

(6) For mercury, 10 mg/kg;

(7) For molybdenum, 35 mg/kg;

(8) For nickel, 200 mg/kg;

(9) For selenium, 28 mg/kg;

(10) For zinc, 2500 mg/kg;

(11) For polychlorinated biphenyls (PCB), 1.0 mg/kg; and

(12) For dibenzodioxins and dibenzofurans, 10 ng/kg TEQ for 2,3,7,8 TCDD and 2,3,7,8 TCDF; and 27 ng/kg for all congeners determined by EPA method 1613A using the 1989 toxic equivalency factors;

(d) Is of sufficiently consistent quality such that for the constituents in (c) above, the mean concentration for data submitted under Env-Ws 807.01(h) plus one standard deviation from the mean does not exceed 1.5 times the concentration specified in (c) above;

(e) Is not a threat to public health, safety, or the environment from other chemical contaminants when assessed according to risk methodologies described in the United States Environmental Protection Agency's Soil Screening Guidance, EPA/540/R-96/018 dated April 1996, the American Society for Testing and Material's E-1739-95, Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites dated November, 1995, or approved equal;

(f) If not generated in New Hampshire, meets the chemical standards of the state of origin;

(g) If the sludge is to be certified for reclamation use, contains enteric virus concentrations of less than one plaque-forming unit per 4 grams of solid on a dry weight basis. Class A sludges shall be deemed to have meet this standard; and

(h) If the sludge is to be certified as a low-metals sludge, does not exceed the following concentrations, expressed as the total concentration on a dry weight basis:

(1) For arsenic, 10 mg/kg;

(2) For cadmium, 10 mg/kg;

(3) For chromium, 160 mg/kg;

(4) For copper, 1000 mg/kg;

(5) For lead, 270 mg/kg;

(6) For mercury, 7 mg/kg;

(7) For molybdenum, 18 mg/kg;

(8) For nickel, 98 mg/kg;

(9) For selenium, 18 mg/kg; and

(10) For zinc, 1780 mg/kg.

Env-Ws 807.04 Expiration of Sludge Quality Certification.

(a) Subject to (b) below, sludge quality certifications shall expire 5 years from the date of issuance.

(b) For all generators in possession of an existing sludge quality certification, such certification shall expire one year from the effective date of 1999 amendments to Env-Ws 800.

(c) Generators of class A sludge shall:

(1) Within one year of the effective date of the 1999 amendments to Env-Ws 800, obtain a sludge quality certification; and

(2) Upon the effective date of the 1999 amendments to Env-Ws 800, comply with the requirements of Env-Ws 807.03(c), Env-Ws 807.03(e), Env-Ws 807.05(e), Env-Ws 807.05(f), Env-Ws 807.06, and Env-Ws 810.02.

Env-Ws 807.05 Testing.

(a) Subject to (b) below, upon submitting an application for a sludge quality certification, the applicant shall submit the results of the analyses of at least 4 representative samples of sludge from the treatment facility or facility, taken at least 60 days apart within the 12 months prior to the date of application and analyzed for the constituents in (d) below.

(b) For batch processes or specified quantities of sludge proposed for land application, a representative composite sample(s) from each batch or specified quantity may be collected on a one time basis according to the procedures in "An Addendum To The POTW Sludge Sampling and Analysis Guidance Document: Sludge Surface Disposal Sampling," by the United States Environmental Protection Agency dated May 1992 and analyzed for the constituents in (d) below.

(c) All samples shall be collected in accordance with the procedures described in "POTW Sludge Sampling And Analysis Guidance Document" by the United States Environmental Protection Agency, dated August 1989 or equal.

(d) Sludges collected according to (a) or (b) above shall be analyzed for the following constituents:

(1) Except for section I, enteric viruses, the compounds in Table 807-I, analyzed in accordance with the methods specified; and

(2) For generators of class B sludge requesting certification of their sludge for reclamation uses, enteric viruses as specified in Table 807-I, section I.

Table 807-I

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| **Section A. Volatile Organic Compounds** | | | | |
| 1 | Dichlorodifluoromethane | 75-71-8 | SW846 - 8000 series | 1.0 |
| 2 | Chloromethane | 74-87-3 | SW846 - 8000 series | 0.7 |
| 3 | Vinyl chloride | 75-01-4 | SW846 - 8000 series | 0.4 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 4 | Bromomethane | 74-83-9 | SW846 - 8000 series | 0.3 |
| 5 | Chloroethane | 75-00-3 | SW846 - 8000 series | 1.0 |
| 6 | Trichlorofluoromethane | 75-69-4 | SW846 - 8000 series | 1.0 |
| 7 | Diethyl ether | 60-29-7 | SW846 - 8000 series | 5.0 |
| 8 | Acetone | 67-64-1 | SW846 - 8000 series | 5.0 |
| 9 | 1,1-Dichloroethene | 75-35-4 | SW846 - 8000 series | 0.5 |
| 10 | Methylene chloride | 75-09-2 | SW846 - 8000 series | 0.1 |
| 11 | Carbon disulfide | 75-15-0 | SW846 - 8000 series | 0.2 |
| 12 | Methyl-tert-butylether (MTBE) | 1634-04-4 | SW846 - 8000 series | 2.0 |
| 13 | trans-1,2-Dichloroethene | 156-60-5 | SW846 - 8000 series | 1.0 |
| 14 | 1,1-Dichloroethane | 75-34-3 | SW846 - 8000 series | 1.0 |
| 15 | 2-Butanone (MEK) | 78-93-3 | SW846 - 8000 series | 1.0 |
| 16 | 2,2-Dichloropropane | 590-20-7 | SW846 - 8000 series | 1.0 |
| 17 | cis-1,2-Dichloroethene | 156-59-2 | SW846 - 8000 series | 1.0 |
| 18 | Chloroform | 67-66-3 | SW846 - 8000 series | 0.1 |
| 19 | Bromochloromethane | 74-97-5 | SW846 - 8000 series | 1.0 |
| 20 | Tetrahydrofuran (THF) | 109-99-9 | SW846 - 8000 series | 1.0 |
| 21 | 1,1,1-Trichloroethane | 71-55-6 | SW846 - 8000 series | 1.0 |
| 22 | 1,1-Dichloropropene | 563-58-6 | SW846 - 8000 series | 1.0 |
| 23 | Carbon tetrachloride | 56-23-5 | SW846 - 8000 series | 1.0 |
| 24 | 1,2-Dichloroethane | 107-06-2 | SW846 - 8000 series | 0.08 |
| 25 | Benzene | 71-43-2 | SW846 - 8000 series | 0.30 |
| 26 | Trichloroethene | 79-01-6 | SW846 - 8000 series | 0.8 |
| 27 | 1,2 Dichloropropane | 78-87-5 | SW846 - 8000 series | 0.1 |
| 28 | Dichlorobromomethane | 75-27-4 | SW846 - 8000 series | 0.02 |
| 29 | Dibromomethane | 74-95-3 | SW846 - 8000 series | 1.0 |
| 30 | 4-Methyl-2-pentanone (MIBK) | 108-10-1 | SW846 - 8000 series | 1.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 31 | cis-1,3-Dichloropropene | 10061-01-5 | SW846 - 8000 series | 0.5 |
| 32 | Toluene | 108-88-3 | SW846 - 8000 series | 1.0 |
| 33 | trans-1,3-Dichloropropene | 10061-02-6 | SW846 - 8000 series | 0.5 |
| 34 | 1,1,2-Trichloroethane | 79-00-5 | SW846 - 8000 series | 0.1 |
| 35 | 2-Hexanone | 591-78-6 | SW846 - 8000 series | 5.0 |
| 36 | 1,3-Dichloropropane | 142-28-9 | SW846 - 8000 series | 1.0 |
| 37 | Tetrachloroethene | 127-18-4 | SW846 - 8000 series | 1.0 |
| 38 | Dibromochloromethane | 128-48-1 | SW846 - 8000 series | 0.01 |
| 39 | 1,2-Dibromoethane | 106-93-4 | SW846 - 8000 series | 0.09 |
| 40 | Chlorobenzene | 108-90-7 | SW846 - 8000 series | 1.0 |
| 41 | 1,1,1,2-Tetrachloroethane | 630-20-6 | SW846 - 8000 series | 1.0 |
| 42 | Ethylbenzene | 100-41-4 | SW846 - 8000 series | 1.0 |
| 43 | m&p-Xylene | 108-38-3<br>106-42-3 | SW846 - 8000 series | 10 |
| 44 | o-Xylene | 95-47-6 | SW846 - 8000 series | 5.0 |
| 45 | Styrene | 100-42-5 | SW846 - 8000 series | 1.0 |
| 46 | Bromoform | 75-25-2 | SW846 - 8000 series | 0.1 |
| 47 | Isopropylbenzene | 98-82-8 | SW846 - 8000 series | 5.0 |
| 48 | 1,1,2,2-Tetrachloroethane | 79-34-5 | SW846 - 8000 series | 0.02 |
| 49 | 1,2,3-Trichloropropane | 96-18-4 | SW846 - 8000 series | 1.0 |
| 50 | n-Propylbenzene | 98-06-6 | SW846 - 8000 series | 5.0 |
| 51 | Bromobenzene | 108-86-1 | SW846 - 8000 series | 1.0 |
| 52 | 1,3,5-Trimethylbenzene | 108-67-8 | SW846 - 8000 series | 5.0 |
| 53 | 2-Chlorotoluene | 95-49-8 | SW846 - 8000 series | 1.0 |
| 54 | 4-Chlorotoluene | 106-43-4 | SW846 - 8000 series | 1.0 |
| 55 | tert-Butylbenzene | 104-51-8 | SW846 - 8000 series | 5.0 |
| 56 | 1,2,4-Trimethylbenzene | 95-63-6 | SW846 - 8000 series | 5.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 57 | sec-Butylbenzene | 135-98-8 | SW846 - 8000 series | 5.0 |
| 58 | p-Isopropyltoluene | 99-87-6 | SW846 - 8000 series | 5.0 |
| 59 | 1,3-Dichlorobenzene | 541-73-1 | SW846 - 8000 series | 5.0 |
| 60 | 1,4-Dichlorobenzene | 106-46-7 | SW846 - 8000 series | 5.0 |
| 61 | n-Butylbenzene | 104-51-8 | SW846 - 8000 series | 5.0 |
| 62 | 1,2-Dichlorobenzene | 95-50-1 | SW846 - 8000 series | 5.0 |
| 63 | 1,2-Dibromo-3-chloropropane | 96-12-8 | SW846 - 8000 series | 0.02 |
| 64 | 1,2,4-Trichlorobenzene | 120-82-1 | SW846 - 8000 series | 2.0 |
| 65 | Hexachlorobutadiene | 87-68-3 | SW846 - 8000 series | 0.2 |
| 66 | Naphthalene | 91-20-3 | SW846 - 8000 series | 5.0 |
| 67 | 1,2,3-Trichlorobenzene | 87-61-6 | SW846 - 8000 series | 2.0 |
| **Section B. Semi-volatile Compounds** | | | | |
| 68 | 1,2-Diphenylhydrazine (as Azobenzene) | 122-66-7 | SW846 - 8000 series | 1.7 |
| 69 | 2,4,5-Trichlorophenol | 95-95-4 | SW846 - 8000 series | 5.0 |
| 70 | 2,4,6-Trichlorophenol | 88-06-2 | SW846 - 8000 series | 1.7 |
| 71 | 2,4-Dichlorophenol | 120-83-2 | SW846 - 8000 series | 1.7 |
| 72 | 2,4-Dimethylphenol | 105-67-9 | SW846 - 8000 series | 2.0 |
| 73 | 2,4-Dinitrophenol | 51-28-5 | SW846 - 8000 series | 12 |
| 74 | 2,4-Dinitrotoluene | 121-14-2 | SW846 - 8000 series | 1.7 |
| 75 | 2,6-Dinitrotoluene | 606-20-2 | SW846 - 8000 series | 1.7 |
| 76 | 2-Chloronaphthalene | 91-59-7 | SW846 - 8000 series | 10 |
| 77 | 2-Chlorophenol | 95-97-8 | SW846 - 8000 series | 2.0 |
| 78 | 2-Methylnaphthalene | 91-57-6 | SW846 - 8000 series | 5.0 |
| 79 | 2-Methylphenol (o-Cresol) | 95-48-7 | SW846 - 8000 series | 5.0 |
| 80 | 2-Nitroaniline | 88-74-4 | SW846 - 8000 series | 5.0 |
| 81 | 2-Nitrophenol | 88-75-5 | SW846 - 8000 series | 5.0 |
| 82 | 3,3'-Dichlorobenzidine | 91-94-1 | SW846 - 8000 series | 4.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 83 | 3-Nitroaniline | 99-09-2 | SW846 - 8000 series | 5.0 |
| 84 | 3&4-Methylphenol (m&p-Cresol) | 106-44-5 | SW846 - 8000 series | 5.0 |
| 85 | 4,6-Dinitro-2-methylphenol | 534-52-1 | SW846 - 8000 series | 12 |
| 86 | 4-Bromophenyl phenylether | 85-68-7 | SW846 - 8000 series | 10 |
| 87 | 4-Chloro-3-methylphenol | 59-50-7 | SW846 - 8000 series | 10 |
| 88 | 4-Chloroaniline | 106-47-8 | SW846 - 800 series | 1.3 |
| 89 | 4-Chlorophenyl phenylether | 7005-72-3 | SW846 - 8000 series | 10 |
| 90 | 4-Nitroaniline | 100-01-6 | SW846 - 8000 series | 5.0 |
| 91 | 4-Nitrophenol | 100-02-7 | SW846 - 8000 series | 12 |
| 92 | Acenaphthene | 83-32-9 | SW846 - 8000 series | 5.0 |
| 93 | Acenaphthylene | 208-96-8 | SW846 - 800 series | 5.0 |
| 94 | Anthracene | 120-12-7 | SW846 - 8000 series | 5.0 |
| 95 | Benzidine | 92-87-5 | SW846 - 8000 series | 12 |
| 96 | Benzo (a) anthracene | 56-55-3 | SW846 - 8000 series | 1.7 |
| 97 | Benzo (a) pyrene | 50-32-8 | SW846 - 8000 series | 1.7 |
| 98 | Benzo (b) fluoranthene | 205-99-2 | SW846 - 8000 series | 5.0 |
| 99 | Benzo (g,h,i) perylene | 191-24-2 | SW846 - 8000 series | 5.0 |
| 100 | Benzo (k) fluoranthene | 207-08-9 | SW846 - 8000 series | 5.0 |
| 101 | Bis (2-chloroethoxy) methane | 111-91-1 | SW846 - 8000 series | 5.0 |
| 102 | Bis (2-chloroethyl) ether | 111-44-4 | SW846 - 8000 series | 1.7 |
| 103 | Bis (2-chloroisopropyl) ether | 39638-32-9 | SW846 - 8000 series | 2.0 |
| 104 | Bis (2-ethylhexyl) phthalate | 117-81-7 | SW846 - 8000 series | 5.0 |
| 105 | Butyl Benzyl phthalate | 85-68-7 | SW846 - 8000 series | 5.0 |
| 106 | Carbazole | 86-74-8 | SW846 - 8000 series | 1.7 |
| 107 | Chrysene | 218-01-9 | SW846 - 8000 series | 5.0 |
| 108 | Di-n-butyl phthalate | 84-74-2 | SW846 - 8000 series | 5.0 |
| 109 | Di-n-octyl phthalate | 117-84-0 | SW846 - 8000 series | 5.0 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 110 | Dibenzo (a,h) anthracene | 53-70-3 | SW846 - 8000 series | 1.7 |
| 111 | Dibenzofuran | 132-64-9 | SW846 - 8000 series | 5.0 |
| 112 | Diethyl phthalate | 84-66-2 | SW846 - 8000 series | 5.0 |
| 113 | Dimethyl phthalate | 131-11-3 | SW846 - 8000 series | 5.0 |
| 114 | Fluoranthene | 206-44-0 | SW846 - 8000 series | 5.0 |
| 115 | Fluorene | 86-73-7 | SW846 - 8000 series | 5.0 |
| 116 | Hexachlorobenzene | 118-74-1 | SW846 - 8000 series | 1.7 |
| 117 | Hexachlorocyclopentadiene | 77-47-4 | SW846 - 8000 series | 5.0 |
| 118 | Hexachloroethane | 67-72-1 | SW846 - 8000 series | 1.7 |
| 119 | Indeno (1,2,3-cd) pyrene | 193-39-5 | SW846 - 8000 series | 1.7 |
| 120 | Isophorone | 78-59-1 | SW846 - 8000 series | 2 |
| 121 | N-Nitroso-di-n-propylamine | 621-64-7 | SW846 - 8000 series | 2.0 |
| 122 | N-Nitrosodimethylamine | 62-75-9 | SW846 - 8000 series | 4.0 |
| 123 | N-Nitrosodiphenylamine | 86-30-6 | SW846 - 8000 series | 2.0 |
| 124 | Nitrobenzene | 98-95-3 | SW846 - 8000 series | 2.0 |
| 125 | Pentachlorophenol | 87-86-5 | SW846 - 8000 series | 4.0 |
| 126 | Phenanthrene | 85-01-8 | SW846 - 8000 series | 5.0 |
| 127 | Phenol | 108-95-2 | SW846 - 8000 series | 5.0 |
| 128 | Pyrene | 129-00-0 | SW846 - 8000 series | 5.0 |
| **Section C. Metals** | | | | |
| 129 | Total Arsenic | 7440-38-2 | SW846 6000/7000 series | 10 |
| 130 | Total Cadmium | 7440-43-9 | SW846 6000/7000 series | 1.0 |
| 131 | Total Chromium | 16065-83-1 | SW846 6000/7000 series | 10 |
| 132 | Total Copper | 7440-50-8 | SW846 6000/7000 series | 10 |
| 133 | Total Lead | 7439-92-1 | SW846 6000/7000 series | 11 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 134 | Total Mercury | 7439-97-6 | SW846 7000 series | 0.05 |
| 135 | Total Molybdenum | 7439-98-7 | SW846 6000/7000 series | 18 |
| 136 | Total Nickel | 7440-02-0 | SW846 6000/7000 series | 10 |
| 137 | Total Selenium | 7782-49-2 | SW846 6000/7000 series | 18 |
| 138 | Total Zinc | 7440-66-6 | SW846 6000/7000 series | 10 |
| 139 | Total Antimony | 7440-36-0 | SW846 6000/7000 series | 8 |
| 140 | Total Beryllium | 7440-41-7 | SW846 6000/7000 series | 0.1 |
| 141 | Total Silver | 7440-22-4 | SW846 6000/7000 series | 4.0 |
| 142 | Total Thallium | 7440-28-0 | SW846 6000/7000 series | 10 |
| **Section D. Pesticides** | | | | |
| 143 | Aldrin | 309-00-2 | SW846 - 8000 series | 0.09 |
| 144 | Gamma-BHC (Lindane) | 58-89-9 | SW846 - 8000 series | 0.09 |
| 145 | Alpha-BHC | 319-84-6 | SW846 - 8000 series | 0.06 |
| 146 | Delta-BHC | 319-86-8 | SW846 - 8000 series | 0.09 |
| 147 | Beta-BHC | 319-85-7 | SW846 - 8000 series | 0.06 |
| 148 | Chlordane | 57-74-9 | SW846 - 8000 series | 0.8 |
| 149 | 4,4'-DDT | 50-29-3 | SW846 - 8000 series | 0.09 |
| 150 | 4,4'-DDE | 72-55-9 | SW846 - 8000 series | 0.07 |
| 151 | 4,4'-DDD | 72-54-9 | SW846 - 8000 series | 0.07 |
| 152 | Alpha-Endosulfan | 959-98-8 | SW846 - 8000 series | 0.07 |
| 153 | Beta-Endosulfan | 33213-65-9 | SW846 - 8000 series | 0.07 |
| 154 | Endosulfan Sulfate | 1031-07-8 | SW846 - 8000 series | 0.07 |
| 155 | Endrin | 72-20-8 | SW846 - 8000 series | 0.07 |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| 156 | Endrin Aldehyde | 7421-93-4 | SW846 - 8000 series | 0.07 |
| 157 | Heptachlor | 76-44-8 | SW846 - 8000 series | 0.2 |
| 158 | Heptachlor Epoxide | 1024-57-3 | SW846 - 8000 series | 0.7 |
| 159 | Toxaphene | 8001-35-2 | SW846 - 8000 series | 0.8 |
| **Section E. Polychlorinated Biphenyls** | | | | |
| 160 | PCB-1242 | 53469-21-9 | SW846 - 8000 series | 0.7 |
| 161 | PCB-1254 | 11097-69-1 | SW846 - 8000 series | 0.7 |
| 162 | PCB-1221 | 11104-28-2 | SW846 - 8000 series | 0.7 |
| 163 | PCB-1232 | 11141-16-5 | SW846 - 8000 series | 0.7 |
| 164 | PCB-1248 | 12672-29-6 | SW846 - 8000 series | 0.7 |
| 165 | PCB-1260 | 11096-82-5 | SW846 - 8000 series | 0.7 |
| 166 | PCB-1016 | 12674-11-2 | SW846 - 8000 series | 0.7 |
| **Section F. Additional Analyses** | | | | |
| 167 | pH | na | SM-4500-H | na |
| 168 | Percent solids | na | SM-2540 G | na |
| 169 | nitrate-nitrite | 14797-55-8<br>14797-65-0 | SM-4500-$NO_3$<br>SW846 - 9210<br>EPA 353 -3000 series | 30 |
| 170 | Total Kjeldalh nitrogen | na | SM-4500-$N_{org}$<br>EPA-351.3 | 300 |
| 171 | ammonia nitrogen | na | SM-4500-$NH_3$<br>EPA-350 | 30 |
| 172 | Total organic nitrogen | na | calculation | na |
| 173 | potassium | na | SM-3500-K<br>SW846<br>6000/7000 series | 15 |
| 174 | phosphorus | na | SM-4500-P<br>EPA-365 | 15 |
| **Section G. Dioxins** | | | | |
| 175 | 2,3,7,8 TCDD & 2,3,7,8 TCDF | 1746-01-6 | EPA 1613A | 5ppt TEQ |
| 176 | Remaining congeners of 2,3,7,8 TCDD | 1746-01-6 | EPA 1613A | 5ppt TEQ |

| # | Compound | CAS | Analytical Method | Detection Limit (mg/kg) |
|---|---|---|---|---|
| **Section H. Cyanides** | | | | |
| 177 | Total cyanides | na | SM-4500-CN | 10 |
| **Section I. Enteric Virus** | | | | |
| 178 | Enteric Virus | na | ASTM-Method D 4994-89 | 1 PFU/ 4 grams |

na - not applicable

(e) The following shall apply to Table 807-I:

(1) Except for (2) and (3) below, the detection limit for all the analyses shall be at or below the detection limits specific in Table 807-I;

(2) If the percent solids in a sludge is below 10%, the results shall be reported in mg/L and the detection limits shall be appropriate to the methodology specified in Table 807-I for a water matrix; and

(3) If the detection limit specified in Table 807-I can not be achieved by the methodology listed, the department shall accept such detection limits which are routinely achievable.

(f) The sludge quality certification holder shall analyze the sludge from its treatment facility or facility at the frequencies specified in Table 807-II, below for the parameters listed in Table 807-I section F above and for the metals in Table 807-I section C above except for antimony, beryllium, silver, and thallium, in accordance with the analytical methods and detection limits specified.

Table 807-II
Frequency of Monitoring - Land Application

| Quantity of Sludge (wet tons) | Frequency |
|---|---|
| 0 - 1600 | Once per 180 days |
| 1600 - 8250 | Once per quarter |
| 8250 - 82,600 | Once per 60 days |
| > 82,600 | Once per month |

(g) For the purposes of Table 807-II in (f) above, "quantity of sludge" means the total quantity of sludge generated in a calendar year that is land applied, sold, or given away in bulk.

(h) The sludge quality certification holder shall analyze sludge from its treatment facility or facility every year for the constituents identified below:

(1) Except for section I, enteric viruses, the compounds in Table 807-I analyzed in accordance with the analytical methods and detection limits specified in the table; and

(2) For generators of class B sludge proposing to maintain certification of their sludge for reclamation uses, enteric viruses as specified in Table 807-I, section I in Env-Ws 807.05(d).

(i) Additional testing shall be required by the department when results of testing conducted by the sludge quality certification holder, site permit holder, or the department show that the requirements in Env-Ws 807.03 have not been met.

(j) If additional testing is required under (i) above, the sludge quality certification holder and all site operators that apply the sludge shall cease land application of sludge until the additional testing, performed in accordance with (k) below, demonstrates that the sludge is acceptable for land application according to the standards of Env-Ws 807.03.

(k) The following additional testing shall be done in accordance with the analytical procedures specified above:

(1) Collect and analyze representative samples of sludge from each stockpile at each site which contains the generator's sludge for the constituent(s) of concern and submit results to the department for review and approval prior to land applying their sludge;

(2) Increase the frequency of testing at the generator's facility for that compound(s) of concern to weekly; continue the weekly sampling until 4 successive weeks show that the concentration of the constituent(s) of concern meets the standards in Env-Ws 807.03, as determined by the department; and

(3) After complying with (2) above, resume land application and increase sampling frequency specified in Env-Ws 807.05 to monthly for the constituent(s) of concern for 6 months.

(l) The department shall reduce the number of constituents required to be tested annually if it determines, based on all available information, that the constituent(s) is not present in the sludge.

Env-Ws 807.06 Reporting.

(a) Every sludge quality certification holder shall submit an annual report by the last business day of January following the issuance of the certificate which contains the following information:

(1) The name and address of the treatment facility which generated the sludge;

(2) Name and telephone number of the operator of the facility;

(3) The sludge quality certificate number;

(4) The quantity of sludge generated, in wet and dry tons;

(5) The results of all testing required by the department and EPA during the previous year including laboratory results presented categorically as required in Env-Ws 807.01(h)(3);

(6) The name, location, and amount, in wet and dry tons, where the sludge was delivered; and

(7) The proposed updated label as required under Env-Ws 810.02, if applicable.

## PART Env-Ws 808 FACILITY PERMIT REQUIREMENTS

Env-Ws 808.01 Facility Permit Applications.

(a) The person proposing to undertake the sludge management activities at the facility shall apply for the facility permit.

(b) The applicant for a facility permit shall provide the following information on a form obtained from the department:

(1) The name, address, and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone number of the applicant's business;

(3) The name and telephone number of the person who can be reached 24 hours a day in case of an emergency;

(4) The location of the proposed facility, including street address, tax map and lot number, and current deed reference;

(5) The name(s), mailing address(es), and telephone number(s) of each operator of the facility including each person's responsibility as it pertains to the regulated activities;

(6) The types of sludge management activities being proposed at the facility, including but not limited to, composting, processing, stockpiling, or treating;

(7) A description of the intended capacity and life of the facility;

(8) A history of the use of the land on which the facility is proposed covering 5 years immediately prior to submission of the application; and

(9) The intended use of the sludge generated and whether sludge quality certification will be sought.

(c) The following shall be submitted with the application:

(1) If applicable, facility plans and specifications for construction and closure stamped by a professional engineer registered in the State of New Hampshire;

(2) The facility plan prepared in accordance with Env-Ws 808.06;

(3) The management plan prepared in accordance with Env-Ws 808.07;

(4) A statement signed by the applicant certifying that:

a. The notification provisions of Env-Ws 803.01 have been complied with;

b. All operators of the facility have been instructed on the requirements of Env-Ws 800 or shall be instructed prior to working at the facility;

c. A copy of the application has been given to the governing body of the municipality in which the activity is proposed to occur; and

d. The information submitted is accurate;

(5) The description of the soil profile characteristics of each test pit or auger boring;

(6) Written verification from the department of resources and economic development indicating whether or not a threatened or endangered species exist on the site;

(7) For sludge monofills, financial assurance shall be provided in accordance with the requirements of Env-Wm 3100 of the solid waste rules;

(8) A copy of the facility closure plan as specified in Env-Ws 808.09;

(9) A list and copies of all other state permits which are required for the proposed facility and evidence that applications for those permits have been submitted;

(10) The name and address of the locally accessible place where all the information required in Env-Ws 808.01 can be reviewed;

(11) Whether the applicant has been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application;

(12) A copy of the Natural Resource Conservation Service county soils map, or portion thereof, with the area(s) of proposed activity clearly delineated, including a description of each soil type found on the site;

(13) The description of the soil profile characteristics of each soil test pit or auger

boring as required in Env-Ws 808.10(c); and

(14) An original of the most recent USGS map, largest scale available, with the latitude and longitude, showing the approximate location and boundaries of the facility.

(d) If the applicant is not the owner, the application shall be accompanied by a written statement in accordance with (e) below, and signed by the owner.

(e) The written statement shall say that the owner is aware that the application is being filed and has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the facility in the event that the department issues the permit.

(f) If the applicant is not the generator of the sludge(s), the application shall be accompanied by a written statement signed by each generator stating that the generator is ultimately responsible for ensuring that the final disposition of the material is performed in accordance with these rules and 40 CFR part 503.

(g) Each application shall be:

(1) Signed by the applicant;

(2) Submitted in duplicate; and

(3) Accompanied by the fee specified in Env-Ws 808.04.

Env-Ws 808.02 Expiration of Facility Permits.

(a) A facility permit issued by the department shall expire 5 years from the date on which it was issued.

(b) Any person operating a facility prior to the effective date of the 1999 amendments to Env-Ws 800 without a valid permit pursuant to Env-Ws 800 shall:

(1) Within 90 days from the effective date of the 1999 amendments to Env-Ws 800, comply with all applicable provisions of Env-Ws 800, other than notification and permitting requirements;

(2) Within 90 days of the effective date of the 1999 amendments to Env-Ws 800, submit facility plans, management plans, contingency plans, and closure plans; and

(3) Within 180 days of the effective date of the 1999 amendments to Env-Ws 800, submit a permit application.

(c) If a permit is denied, all sludge management activities shall cease and all material shall be removed from the facility and the facility shall be closed in accordance with Env-Ws 808.09.

Env-Ws 808.03 Renewal of Facility Permits. Any person to whom a facility permit has been issued, and who wishes to renew the permit, shall apply for a permit modification under Env-Ws 804.08(b) and submit the permit fee required by Env-Ws 808.04 to the department no later than 180 days prior to expiration of the permit.

Env-Ws 808.04 Permit Fees.

(a) A fee in the amount of $500 shall accompany each application for issuance or renewal of a facility permit to compost sludge.

(b) A fee in the amount of $1,000 shall accompany each application for issuance or renewal of a facility permit to mix, treat, process, or dispose of sludge other than for sludge composting.

(c) Any New Hampshire municipality that applies for a facility permit or has its sludge managed at a facility shall be exempt from the fees specified in (a) and (b) above.

(d) Fees, if paid by check or money order, shall be made payable to "Treasurer-State of NH."

Env-Ws 808.05 Criteria for Review. The department shall issue or renew a facility permit if it determines that the following criteria have been met:

(a) All applicable requirements of the rules have been met;

(b) All state permits which are necessary for the construction and operation of the facility have been applied for;

(c) Management of sludge at the facility, in accordance with the application, shall not violate any statues or rules implemented by the department;

(d) The permit holder has not been convicted of a misdemeanor under any statute administered by the department within the 5 years prior to the date of application, or of a felony in any state or federal court during the 10 years prior to the date of application;

(e) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department; and

(f) The sludge management activities which will be conducted at the facility shall not adversely affect threatened or endangered species.

Env-Ws 808.06 Facility Plans. Facility plans required under Env-Ws 808.01(c)(2) shall be at a scale appropriate to show all information contained on the plan clearly and include the following:

(a) A locus map which identifies the proposed facility location and details the proposed route of access to the site;

(b) The total available land area, in acres, and the specific acres to be used for facility

operations, including proposed stockpile or storage tank locations;

(c) The identification of access roads and access control measures, including perimeter fencing and buffer distances;

(d) The identification of roads, property lines, structures whether on or off the property, and any easements or rights-of-way which exist on the property;

(e) The identification of proposed measures to control surface runoff to or from the facility and stockpile locations, if applicable;

(f) The identification of surrounding land use within 500 feet;

(g) All soil test pit and auger boring locations;

(h) The approximate location of and distance to all dwellings, structures, and water supply wells within 500 feet of the facility;

(i) The names and addresses of all abutters;

(j) The name and location of all surface waters within 500 feet of the facility, including their designated river classification under RSA 483, New Hampshire rivers management and protection program, if applicable;

(k) The scale of the plan;

(l) An arrow indicating which direction on the plan is north;

(m) The location of all poorly and very poorly drained soils; and

(n) If applicable, the location of the items required in Env-Ws 809.02(b).

Env-Ws 808.07 Management Plans. Management plans required under Env-Ws 808.01(c)(3) shall include the following:

(a) The normal hours of operation of the site;

(b) Storage or stockpiling provisions, if applicable;

(c) The name of the generator(s) and its corresponding sludge quality certification numbers, if applicable;

(d) The quantity of sludge, in wet and dry tons, expected on a periodic basis, such as daily, weekly or monthly;

(e) The quantity of sludge, in wet and dry tons, expected over the entire life expectancy of the facility, if applicable;

(f) Additional on-site measures to be taken to control vectors;

(g) A detailed odor control plan explaining:

(1) The procedures that shall be used to address and resolve any odor complaints;

(2) Additional management techniques employed to minimize odors; and

(3) The name, address, and telephone number of the person(s) who shall be responsible for responding to odor complaints; and

(h) A copy of the facility contingency plan describing course(s) of action to be followed in case of emergency or other special conditions, such as:

(1) Equipment breakdowns;

(2) Fire;

(3) Vectors;

(4) Explosion;

(5) Spills;

(6) Receipt or release of hazardous or toxic materials or substances;

(7) Groundwater, surface water, or air contamination attributable to a facility; and

(8) Other incidents that could threaten human health or safety, or the environment.

Env-Ws 808.08 Facility Standards.

(a) New facilities for the treatment or processing of sludge, such as sludge treatment facilities and sludge lagoons, shall be designed and constructed in accordance with the requirements of the "Guides for the Design of Wastewater Treatment Works" by the New England Interstate Water Pollution Control Commission, dated 1998.

(b) Sludge composting facilities and sludge monofills shall be designed, constructed, operated and closed in accordance with the requirements of Env-Wm 2300 and Env-Wm 2500, respectively, of the solid waste rules.

(c) All facilities shall:

(1) Be operated in such a manner so as to minimize the impact on abutters and the surrounding community;

(2) Be posted with signs which:

a. Contain the name and telephone number of the operator;

b. State "This is a Sludge Management Area";

c. Are printed with block letters no less than 2 inches in height, and with the name and address of the owner or lessee of the property; and

d. Are no more than 100 yards apart on all sides and shall also be posted at gates, bars, and commonly used entrances;

(3) Restrict access by the installation of a locked gate or cable;

(4) Be operated such that odors from the facility are minimized;

(5) Be maintained in a clean and orderly fashion to minimize attraction of vectors; and

(6) Be closed in accordance with Env-Ws 808.09.

(d) In addition to the requirements in (c) above, all lagoons shall be:

(1) Fenced around the perimeter to control access;

(2) Maintained to provide a minimum of 2 feet of freeboard at all times; and

(3) Bermed on all sides to divert surface drainage away from the lagoons.

(e) Subject to (g) below, no person shall site or operate a facility within the buffer distances specified in Table 808-I:

Table 808-I
Buffer Distances (in feet)

For Processing, Stockpiling or Storage Facilities

| | |
|---|---|
| Nearest Well | 500[a] |
| Surface Water | 250 |
| Surface Drinking Water Source | 500 |
| Nearest Occupied Dwelling | 500[b] |
| Property Line | 500[b] |
| Groundwater Depth | 4 |
| Bedrock / Restrictive Layer | 4 |

(f) The following shall apply to Table 808-I:

(1) The letter "a" shall indicate that the distance to the nearest well shall be as far as practical, but in no case closer than 500 feet; and

(2) The letter "b" shall indicate that the distance to the nearest occupied dwelling or property line shall be as far as practical beyond 500 feet, but may be reduced below 500 feet with the occupant's prior written consent.

(g) Facilities which are in operation prior to the effective date of the 1999 amendments to Env-Ws 800 shall comply with the buffer distances, identified in Table 808-I, within 90 days, as applicable.

Env-Ws 808.09 Closure Plans.

(a) All sludge facilities that have not closed as of the effective date of the 1999 amendments to Env-Ws 800 shall submit a closure plan to the department within 120 days of such effective date.

(b) The closure plan shall include the following:

(1) The facility identification, including name, mailing address, location, and permit number, if applicable;

(2) A description of the procedures for removing all material from the facility, if applicable, and the intended final disposition of the materials;

(3) A description of any proposed site work that will be performed to regrade and or revegetate the area;

(4) The schedule of closure activities and anticipated closure date; and

(5) A description of how notification shall be given to all users of the facility of the termination of operation of the facility.

(c) At least 60 days prior to the planned cessation of facility operations, the permittee shall provide the department and the municipality in which the facility is located, with written notice of

the intent to close the facility.

(d) The notice shall include the following:

(1) The facility identification, including permit number;

(2) The date the facility intends to stop receiving and/or processing sludge;

(3) A copy of the facility's approved closure plan or file reference thereto; and

(4) The date the facility intends to begin closure activities and estimated closure completion date.

(e) The permittee shall notify the department and the municipality in which the facility is located when closure is complete.

Env-Ws 808.10 Testing.

(a) One soil test pit or auger boring shall be taken, at a depth of at least 40 inches, for each soil mapping unit present on the Natural Resource Conservation Service county soils map, but no less than one every 5 acres.

(b) One soil test or auger boring shall be taken, at a depth of at least 6 feet, for each area proposed for storage.

(c) An analysis of the soil test pits or auger borings shown in (b) and (c) above shall be performed and shall include a description of the soil profile characteristics, depth to the seasonal high water table, bedrock, or other restrictive layer.

Env-Ws 808.11 Record keeping.

(a) Every facility permit holder shall maintain records of each load of sludge received at the facility, including identification of:

(1) The date received;

(2) The hauler delivering the load;

(3) The quantity of each load of sludge received by the generator, in wet tons and percent solids; and

(4) The sludge quality certification number.

(b) Facility plans, management plans, closure plans, and records shall be maintained by the permit holder, and shall be available to the department for review during business hours. If the department believes that violations of RSA 485-A or these rules relative to sludge management have

occurred, the department shall require the permit holder to submit copies of all records.

(c) Facility plans, management plans, closure plans, and records shall be maintained for a minimum of 5 years after closure of the facility.

Env-Ws 808.12 Reporting.

(a) The permit holder shall report all complaints. Information shall be provided to the department orally within 24 hours of receipt of a complaint. A written submission shall be provided within 5 days of the complaint and shall contain a description of the complaint, including exact dates, times, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the concern.

(b) Every facility permit holder shall submit an annual report for each facility to the department by the last business day of January for each calendar year in which the permit is valid, regardless of whether or not the facility received or processed sludge during the previous calendar year.

(c) The annual report shall contain the following information:

(1) The name and address of the facility;

(2) The permit number;

(3) The name of the permit holder;

(4) The total quantity of sludge, in wet and dry tons, received at the facility from each generator and their sludge quality certification number; and

(5) The quantity of all material distributed, in wet and dry tons.

(d) If any of the information differs from that previously supplied to the department concerning the activity, the permit holder shall note those differences in the annual report.

## PART Env-Ws 809 GROUNDWATER MONITORING

Env-Ws 809.01 Applicability. Groundwater shall be monitored at the following:

(a) Sludge monofills;

(b) Sludge lagoons;

(c) Reclamation sites; and

(d) Those sludge management activities conducted at facilities, such as outside sludge stockpiles or compost piles containing leachable constituents, which, if not properly managed, might result in contamination of groundwater.

Env-Ws 809.02 Groundwater Monitoring Plan Requirements.

(a) The applicant shall submit a groundwater monitoring plan which includes:

(1) The constituents to be monitored;

(2) The location and identification of all sampling points;

(3) The sampling frequency;

(4) The sampling methodologies;

(5) The analytical methodologies; and

(6) The procedures that shall be used to establish background concentrations of all constituents required for monitoring. "Background concentrations" means concentrations detected in areas unaffected by the site or facility permitted or to be permitted.

(b) In addition to (a) above, the applicant shall include the following on the site or facility plan prepared in accordance with Env-Ws 806.06 and Env-Ws 808.06, respectively:

(1) The location, elevation, and datum of a bench mark, if a survey is conducted to establish topography;

(2) Ground surface spot elevations and contours to show topography, using information from the most recent USGS map, or more accurate information, if available;

(3) The identification and location of the existing and proposed groundwater monitoring wells, showing at least one hydraulically up gradient and 2 hydraulically down gradient wells;

(4) The identification and location of any surface water sampling points;

(5) Groundwater contours which accurately show groundwater flow direction;

(6) A description of the method used to develop groundwater contours, including the identification and location of any piezometers;

(7) A table of water level measurements and elevations found in any piezometers and monitoring wells used to develop the groundwater contours;

(8) Well construction details of any existing monitoring wells, top of well casing elevations, and measured depth to water table from top of casing; and

(9) Well construction details of any proposed monitoring wells.

Env-Ws 809.03 Corrective Action Plan.

(a) If the concentration of any constituent required by the department to be monitored under the groundwater monitoring plan exceeds the background value, in accordance with (b) below, at any down gradient monitoring well, the permit holder shall notify the department within 10 days and shall commence monthly monitoring for each constituent, and at each well where background has been exceeded, monthly monitoring shall continue until the results demonstrate that background has not been exceeded for 2 consecutive months.

(b) Background shall be deemed to be exceeded when any of the following conditions exist:

(1) The concentration of a monitored constituent exceeds the background concentration, as established in Env-Ws 809.02(a)(6), by more than the analytical detection limit for that constituent;

(2) The concentration of a monitored constituent previously undetected using the procedures established in Env-Ws 809.02(a)(6) exceeds the analytical detection limit by a factor of 1.5; or

(3) For nitrate monitored at reclamation sites, the concentration exceeds 5 mg/L above the background nitrate concentration or 9 mg/L, whichever is less.

(c) If the concentration of the constituent(s) detected by the additional monitoring exceeds the background concentration for 2 consecutive months, but is below the ambient groundwater quality standard, the permit holder shall:

(1) Notify the department within 10 days;

(2) For reclamation sites, cease operation;

(3) Continue monthly monitoring; and

(4) Within 30 days submit to the department for review and approval a corrective action plan which shall describe the exceedances, the source(s) of the exceedances and the proposed measures to be taken to eliminate the exceedances.

(d) The department shall approve the corrective action plan if it determines that the action shall:

(1) Achieve compliance with background and ambient groundwater quality standards;

(2) Eliminate any future discharges of the constituent(s) that was causing the exceedances of background values to the groundwater; and

(3) Protect human health and the environment.

(e) The corrective action shall be initiated within 30 days of department approval and

implemented in accordance with an approved implementation schedule.

(f) If the concentrations of any monitored constituent detected by any required monitoring are above the ambient groundwater quality standard, the permit holder shall:

(1) Cease operation;

(2) Notify the department within 10 days; and

(3) Apply for a groundwater management permit.

Env-Ws 809.04 Water Quality Sampling, Analysis, and Reporting.

(a) Analyses shall be performed by a laboratory certified by the USEPA or the New Hampshire department of environmental services pursuant to Env-C 300.

(b) Sampling shall be performed in accordance with:

(1) Sampling procedures and protocol described in "Practical Guide for Ground-Water Sampling," document identification number EPA/600/2-85/104, USEPA; and

(2) "RCRA Ground-Water Monitoring Enforcement Guidance," document identification number PB87107751, USEPA.

(c) The results of all regularly scheduled testing shall be summarized and submitted with the annual report.

Env-Ws 809.05 Groundwater Monitoring Wells.

(a) Unless alternative methods, which are equivalent to (1) and (2) below, are approved by the department, monitoring wells shall be designed, installed, and decommissioned in accordance with the practices described in:

(1) "Standard Practices for Design and Installation of Ground Water Monitoring Wells in Aquifers," American Society for Testing and Materials, Designation: D 5092 - 90, approved June 29, 1990, and published October 1990, readopted - 1995; and

(2) "Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells," document identification number EPA/600/4-89/034, USEPA, March 1991.

(b) Monitoring wells shall be:

(1) Developed prior to sampling; and

(2) Allowed to equilibrate a minimum of 2 weeks prior to sampling.

## PART Env-Ws 810 REQUIREMENTS FOR CLASS A SLUDGE

Env-Ws 810.01 Requirements for Land Application.

(a) All persons who land apply class A sludge shall comply with the following:

(1) If the sludge is not certified as low-metals sludge under Env-Ws 807.03, the application rate shall not exceed the annual application limits stated on the label required under Env-Ws 810.02; and

(2) Sludge shall not be applied within 35 feet of surface water.

(b) In addition to (a) above, all persons who land apply class A sludge on a contiguous area of more than 5 acres shall:

(1) Obtain and follow the nutrient recommendation from UNH cooperative extension, USDA, NH department of agriculture, NRCS, or other certified agricultural or crop advisors, for the application area; and

(2) Maintain sludge stockpiles to minimize the amount of water running on, off, or through the stockpile.

Env-Ws 810.02 Label Requirements.

(a) The generator of class A sludge shall submit to the department with the application for a sludge quality certification, and annually with the annual report required under Env-Ws 807.06, a proposed label.

(b) The proposed label shall include the following:

(1) The name, address, and telephone number of the generator;

(2) A brief description of the product, including the process employed to treat or stabilize the sludge;

(3) Recommended uses and appropriate application rates;

(4) Average nutrient analysis for nitrogen, phosphorus, and potassium based upon the analytical results required under Env-Ws 807.05(e) from the previous year; and

(5) Average metals concentration for the 10 metals listed in Env-Ws 807.03(c) based upon the analytical results required under Env-Ws 807.05(e) from the previous year.

(c) The department shall approve the label within 30 days of receipt, if it determines that the information in the proposed label is complete and correct.

Env-Ws 810.03 Record keeping. The generator shall record the name and address of all persons receiving at one time more than 20 cubic yards of sludge.

## PART Env-Ws 811 REQUIREMENTS FOR WAIVERS

Env-Ws 811.01 Requirements for Waivers.

(a) The rules contained in this part are intended to apply to a variety of conditions and circumstances. It is recognized that strict compliance with all rules might not fit every conceivable situation.

(b) Requests for waivers shall be submitted in writing to the department.

(c) Requests for waivers shall include the following information:

(1) The name, address, and telephone number of the person requesting the waiver;

(2) The permit or sludge quality certification to which the waiver request relates, and its permit or certification number, if applicable;

(3) A specific reference to the section of the rule for which a waiver is being sought and an explanation of why a waiver is necessary;

(4) An explanation of the alternatives for which a waiver is sought, with supporting data; and

(5) A full explanation of how the alternatives for which a waiver sought:

a. Are consistent with the intent of RSA 485-A and RSA 485-C; and

b. Would provide an equivalent level of protection of human health and the environment.

(d) The department shall approve a request for a waiver upon finding that:

(1) The alternatives proposed are at least equivalent to the requirements contained in these rules;

(2) They are adequate to ensure that the provisions of RSA 485-A and RSA 485-C are met; and

(3) Human health, safety, and the environment shall be protected.

(e) No waiver shall be granted which, in the judgment of the department, contravenes the intent of any statute or rule.

(f) The department shall issue a written response to a request for a waiver within 90 days of receipt of the request.

# L. J. WADLEIGH FARM

280 SCHOOL STREET
TILTON, N.H. 03276-5756

Senate Committee on Environment
State House Office Building
State Street
Concord, N.H. 03301

May 5, 1999

Re: SB 218

Dear Sirs:

The Lewis J. Wadleigh farm is a fifth generation family farm. Many years ago it was considered one of the most modern farms around. Unfortunately it has never quite recovered from the depression and some bad investments. The five children of Lewis and Winifred Wadleigh hope to restore the farm to its past stature.

An integral part of the restoration requires fertilization of the fields. If biosolids are acceptable, we had hoped to use it as an inexpensive source of both nutrients and organics.

We are of the opinion that the experts in the NHDES and EPA have the knowledge and expertise to determine the safety of biosolids.

We therefore strongly support HB 504, HB 222 and HB 546.

We oppose HB 335, HB 334, HB 472 and HB 504.

It seems rather peculiar that we trust our inspectors to determine and protect the safety of prescription drugs, meats, fruits, vegetables and even the air we breath, yet we question their integrity to determine the safety of biosolids.

Thank you for your careful consideration of this extremely important subject.

Nicholas Wadleigh
Sara Allesbury
Julia Dyker
David Wadleigh
Ben Wadleigh

# New Hampshire SIERRA CLUB®

May 13,1999

Further Comments in Support of SB 218 as amended:

SB 218 as amended will not result in a ban of Class B land application. Nor will it disrupt New Hampshire's agricultural activities. The vast majority of NH farmers choose not to use sludge as fertilizer: In 1997 two dozen communities and 31 farmers applied sludge to NH land. The industry and DES are encouraging this activity, not because it will benefit farming, but because it is the least costly way to dispose of a contaminated product.

SB 218 as amended would place NH sludge policies more in line with those of the other New England states ( three of which do not apply any Class B sludge on agricultural land). This bill would also discourage the importation of low quality out-of-state sludge. It is the first step toward insuring that NH land application policies are based on recent and sound science, rather than on expediency.

SB 218 has been amended to address some of DES and industry concerns as follows:

- The ambiguity of dioxin standards for sludges applied to pastures has been eliminated. Instead, the bill specifies that sludges exceeding 1 ppt dioxin TEQ shall not be put on grazing pastures.

( A re-analysis of the EPA's 1987 and 1994 background dioxin level data indicates that the average soil level is 1 ppt. In pristine and rural areas ( where most sludge is land applied) only one of

3 Bicentennial Square, Concord, NH 03301
phone: (603) 224-8222 fax: (603) 224-4719 e-mail: david.ellenberger@sierraclub.org
website: www.mv.com/org/nhsc

Printed on Recycled Paper

May 13,1999

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- The ambiguity of dioxin standards for sludges applied to pastures has been eliminated. Instead, the bill specifies that sludges exceeding 1 ppt dioxin TEQ shall not be put on grazing pastures.

( A re-analysis of the EPA's 1987 and 1994 background dioxin level data indicates that the average soil level is 1 ppt. In pristine and rural areas ( where most sludge is land applied) only one of

138 soil samples tested positive, at 0.5 ppt. Dioxin is persistent and magnifies in the food chain, especially in dairy products. This is why Wisconsin limits soil concentration of dioxin to 0.5 ppt for agricultural land subject to grazing.)

- Class A sludge is excluded from most provisions of this bill.

- The additional notification requirements have been eliminated that would have prohibited the use of Class A sludge.
- The 30 day stockpiling limit applies only to application sites. Sludge may be stockpiled for longer periods at waste water treatment plants.
- The vertical soil buffer for stockpiles has been reduced from 4 to 3 feet to more accurately reflect NH water table levels.

Section 2 : Sludge Quality Certification Requirements:

I. The old rules required that all industrial waste water contributors list the chemical constituents of their waste water. To help identify the contaminants in sludge and to know what to test for, regulators must know what industrial chemicals are being discharged into the waste water stream. ( Current rules require that only industries with pretreatment programs need to list the chemical constituents of their waste water.)

II. This bill's more protective limits on toxic and persistent heavy metals are recommended by the NH Bureau of Health Risk Assessment. These metal standards have been reviewed by Murray McBride, Professor of Soil Chemistry at Cornell University who has done extensive research on how metals in sludge effect agricultural soils. " Although the allowable concentrations of a number of the heavy metals would still be high enough to cause accumulation of the metals in soils, and

may lead to adverse effects in the long-term, sludges meeting the metal contaminant standards proposed in SB 218, and applied at agronomic rates, would not be likely to have significant harmful effects in the short term. I believe this bill is a step in the right direction."

III. The two year renewal provision which was in the old rules, assures more frequent testing. Under the current rules, certification lasts from five to ten years before it needs to be renewed. More frequent testing is necessary because sludge is not a uniform product, but varies in its contaminant level from batch to batch, even in samples taken from the same treatment plants.

IV. Best Management Practices. UNH scientists, not industry, should determine agronomic application rates and nutrient management plans. This was in the old rules. UNH has specialists in this aspect of sludge management, whose expertise should be utilized.

485-A:5-g:

Under state law, towns have the right to regulate sludge under local ordinances. Most towns that have adopted local ordinances are small and do not generate a lot of septage. They need to be protected from being forced to accept large amounts of sludge. This provision assures that these towns are not excluded from sending their septage to treatment plants, just because they have adopted sludge ordinances.

# City of Concord, New Hampshire

**GENERAL SERVICES DEPARTMENT**
**WASTEWATER TREATMENT FACILITY**
**125 HALL STREET, 03301**

TELEPHONE (603-225-8691) FAX (603-224-2532)

*MICHAEL J. HANSCOM*
SUPERINTENDENT


March 30, 1999

Senator Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 102
33 North State Street
Concord, NH 03301

Re: SB 218, regulating the land application of sewage sludge

Dear Chairman Russman:

The City of Concord's Hall Street Wastewater Treatment Plant produces lime stabilized Class B sludge/biosolids, and has managed this residual since 1991 through a beneficial reuse program which includes agricultural land application and land reclamation projects. During this period over 50,000 wet tons of sludge/biosolids have been recycled, resulting in estimated savings to sewer users in Concord, Boscawen, and Bow of $2,000,000.

The City of Concord supports the adoption of reasonable, environmentally sound, scientifically based legislation and regulations. In support of continued viability of the land application of appropriate residuals in New Hampshire, the City of Concord would like to be entered into the record as opposing the adoption of SB 218.

The bulk of documented, peer reviewed scientific research confirms the benefits and safety of properly managed sludge/biosolids recycling programs. The recently adopted NHDES Env-Ws 800 rules considered, and addressed all of the significant issues brought forth in this legislation in an open and public process, and resulted in a document which is scientifically defensible and protective of public health and the environment. The imposition of arbitrarily restrictive pollutant limits or site management requirements serves only one purpose - to eliminate the practice of biosolids land application in New Hampshire. Class A compost facilities, in which some municipalities have made a significant monetary investment, would also be effected.

As you deliberate these bills, I urge you to reflect on the fact that many communities in this state share the City of Concord's support of biosolids land application programs and understand the benefits associated with recycling of appropriate residuals. Please recognize the fiscal impact to communities and the lack of

other long-term, sustainable options. There would also be a direct fiscal impact to the State through increased sewer charges in the communities that have wastewater treatment plants. In the City of Concord, State of New Hampshire agencies currently pay $120,000 per year in sewer user charges. We estimate the cost of alternative biosolids disposal options to be approximately $500,000 per year more than our current land application program. This would increase sewer user charges by approximately 10%, resulting in a direct cost increase to the State of $12,000 per year.

The City believes the adoption of standards which are more stringent than Federal standards provided under 40 CFR Section 503 establishes an unfunded mandate prohibited by the State Constitution Part 1, Art. 28-a. It is likely that Concord would join with other municipalities in seeking relief through the courts should this legislation be adopted.

Thank you for your consideration of these comments.

Sincerely,

Michael J. Hanscom
WWTP Superintendent

cc: John Forrestall, General Services Director
Judy Silva, NHMA
Shelagh Connelly, WMRMI

COPY

April 1, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 104
33 North State Street
Concord, NH 03301

**RE: SB 218 - Inexpedient to legislate**

Dear Chairman Russman:

For the record, my name is Erick Sawtelle and I farm fields in Dover, Madbury, Barrington, Durham, Lee, Newmarket, Newfields, and Epping, New Hampshire. We manage over 680 acres and produce feed for 450 head of dairy and beef cattle. I have utilized biosolids since 1993 as part of my nutrient management program.

***As a full-time farmer I urge the committee to vote inexpedient to legislate on SB 218.***

Most of the language in this bill is redundant to the existing Env-Ws 800 Sludge Management Rules recently revised by the NH Department of Environmental Services. There does not seem to be any good reason to address such issues by statute when regulation has already been adopted to address biosolids utilization.

One area that exemplifies the myriad problems with SB 218 as written is the issue of stockpiling as specified in the proposed language of paragraph 2.VIII which limits stockpiling "*up to and including thirty days before any planting or seeding*". This single provision will eliminate stockpiling for the other eleven months of the year. We currently stockpile for 4 – 6 months in advance of planting or seeding in order to get enough biosolids to meet the crop needs. If SB 218 passes, I will not be able to effectively use biosolids to fertilize my crops. Also, w*hat will be done with the biosolids for these other eleven months?*

As a sponsor of this bill, my Senator [Katherine Wheeler] does not represent my views on the beneficial use of biosolids as a recyclable resource. For this and many other reasons, which I would be happy to expound upon in greater detail, **I urge the committee to vote inexpedient to legislate on SB 218.**

I am happy to speak with any committee members about biosolids use on my farm. We hope to be spreading biosolids in mid-May and you are invited to come and see first-hand how this resource benefits my land and nutrient management program.

Sincerely,

Erick Sawtelle
Pinewoods Yankee Farm
288 Lee Hook Road
Durham, NH 03824
603.659.8106

CITIZENS
FOR A
FUTURE NEW HAMPSHIRE
PO BOX 38
N. SANDWICH, NH 03259

June 10, 1999

HB 546-FN-A

Senator Russman and Members of the Senate Environment Committee:

For the record I am Professor Caroline Snyder and chair Citizens for a Future New Hampshire, an organization that collects, analyzes, and disseminates recent and scientifically accurate information on the safety of land application of sewage sludge and of industrial paper mill sludge.

Based on our research and on information we have gathered from peer reviewed articles, field studies, soil scientists, toxicologists, ecologists, environmental scientists and from the preliminary NEBRA and UNH nitrate leaching data, as well as from DES data on toxic organic chemicals that leached from paper mill sludge stock piles at Pelham, NH, we are convinced that many harmful contaminants will leach from sludge into ground water when sludge is disposed in spent gravel pits that are located on aquifers. A number of UNH professors, certified New Hampshire soil scientists, the Sierra Club of New Hampshire, the New Hampshire Rivers Council, the Conservation Law Foundation, environmental groups and concerned citizens across the state, and the US EPA all agree with us: spent gravel pits, located on aquifers should not be sludged: especially not with quantities that are a hundred times higher than the agronomic rate.

This is why we strongly support section 1 of the amendment of HB 546-FN-A , especially the funding of research on gravel pit reclamation that does not require top soil or sludge.

We also support further research on contaminants other than nitrates; much data on nitrates already exists. EPA guidelines are very clear: don't exceed agronomic application rates at reclamation sites where there is the potential for nitrate to leach into potable ground water. Unfortunately, the NH Department of Environmental Services and NH industries are ignoring these science-based EPA guidelines.

We support long range studies on metals, toxic organics and surfactants. Especially research on interactions of these chemicals. For example, we have data that indicates that toxic heavy metals in soil will retard the degradation process of some pesticides; we have data that indicates that solvents in paper mill sludge can mobilize dioxins that would otherwise be tightly bound to soil particles; and we have data that show that some surfactants commonly found in all sludges ( APEs) not only are health hazards by themselves, but can desorb other toxic organics causing them to leach into ground water.

Although we support this research, we are concerned because two bills, SB 218 and HB 335 that prohibit sludging of gravel pits, have been re-referred to their respective

committees. We are concerned that the industry will try to defeat these bills by arguing that the sludging of gravel pits must continue so the research (authorized by this bill) can continue.

No other state jeopardizes the quality of its ground water by permitting gravel pit reclamation with sludges. The sludge disposed of in NH gravel pits typically consists of ¼ sewage sludge and ¾ paper mill sludge. Sewage sludge has undergone a lengthy and costly federal risk assessment. This risk assessment is based on 30 year old science and is flawed in other ways. Yet land application of paper mill sludge has never even undergone any risk assessment. So ¾ of what is put in gravel pits is basically an unstable chemical mixture containing several suspected and known human carcinogens and many other toxic organics that can be harmful to human health.

This is why we support research on existing reclaimed gravel pits and support authorizing funds for UNH research on how vegetative covers can be established on spent gravel pits that do not require top soil , sludge, or chemical fertilizers.

Thank you for considering our testimony.

Caroline Snyder

Caroline Snyder

# Warner Village Water District

APR 06 1999

P.O. Box 252
55 West Joppa Rd.
Warner, N.H. 03278

Office of Commissioners

Tel. (603) 456-3890

March 29, 1999

The Honorable Richard L. Russman, Chairman
Senate Environment Committee
Legislative Office Building, Room 102
Concord, NH 03301

RE: SB218 Regulating the Land Application of Sewage Sludge

Dear Chairman Russman:

The Warner Village Water District (District) services its 200 customers with both water and wastewater. The water system, which consists of two wells is simple, efficient, and was constructed through Community Development Block Grants. The cost of operation and maintenance is slightly higher than New Hampshire's yearly average customer cost for water, at approximately $254.00 per year per customer. The wastewater system is more complex, was constructed with EPA monies, and costs more to operate and maintain. The yearly cost to our customers is approximately $675.00, fifth highest in New Hampshire. Our customers pay an average of $925.00 for the privilege of drinking safe water, and having their wastewater treated in an approved environmentally sound manner.

Like most other wastewater treatment plants in New Hampshire, the District's wastewater treatment plant produces an end product: Biosolids. However, unlike most other wastewater treatment plants, we currently have the option to treat our Biosolids on site for upwards of 10 years, through the use of reed beds. At the end of 10 years, the reed beds must be stripped of their contents and replanted for another cycle. The Biosolids, which have been composted through these 10 years, are tested for contaminants, lime stabilized and then land applied, within the Town of Warner. The current costs associated with this method of treatment average approximately $1,200.00 per year for the 10 years. These costs are included in the above $675.00 average yearly customer sewage rate.

The District's wastewater treatment plant produces 180,000 gallons of 2% Biosolids on a yearly basis. If the District were not able to use our

current Biosolids treatment method, the next least costly method would be trucking of this material to the Concord, NH, wastewater treatment facility. Transportation, Biosolids treatment and testing would cost $21,300.00 per year. This would add $130.00 per year to the sewage rate of $675.00, which equals $805.00, a 14.3% increase.

If SB218 were passed, and we were not able to use our reed beds, nor land apply Biosolids to acreage in Warner, and the Concord wastewater treatment facility was not able to receive our Biosolids, our costs for Biosolids would increase dramatically. The District would have to transport the 180,000 gallons of 2% Biosolids out-of-state. The calculated transportation, Biosolids treatment and testing costs would be $42,500.00 per year. This would add $212.50 per year to the sewage rate of $675.00, which equals $887.50, a 31.5% increase.

The District's Biosolids have passed the NHDES Sludge Quality Certification and are rated Class B in accordance with the current NHDES Sludge Rules. If you and the Senate choose to pass SB218, this action will effectively quash the District's efforts to keep Biosolids treatment and disposal an affordable option for its customers.

Sincerely,

James A. Bailey
Superintendent, WVWD

JAB/jab
Cc: Commissioners, floppy file, file

**Lara Saffo, Esquire**
**Post Office Box 336**
**23 Jackson**
**North Woodstock, New Hampshire 03262**
**(603) 745-6369**

March 3, 1999

New Hampshire State Senate
Senate Environment Committee
Concord, New Hampshire

RE: Sludge: Senate Bill 218

Dear Senators:

I wish I could be present at the hearing for Senate Bill 218, important legislation that will protect New Hampshire's environment. Please realize that my, and other's inability to attend the hearing does not mean we do not care, deeply, about the issue of sludge in New Hampshire. On the contrary, we have been, and still are, incredibly concerned.

I am in favor of all aspects of Senate Bill 218. This letter, however, will speak to the prohibition on wastewater treatment plants from excluding towns that regulate sludge disposal within their borders.

New Hampshire law specifically permits towns to regulate sludge. However, small towns are being punished when they exercise this right because the larger towns exclude them from utilizing their wastewater treatment plant - effective immediately. This penalty is upsetting, especially when the small towns are thereby forced to accept, in one year, more sludge than the town could possibility generate in a hundred years. It is my understanding that the wastewater treatment plants are not asking the smaller towns to accept sludge generated at the particular treatment plant that the small town utilizes. On the contrary, the wastewater treatment plants are demanding that the small towns accept sludge from any source, including sludge from out of state industrialized cities. One need only look the Department of Environmental Service's chart which outlines the source of sludge and the location in which it is disposed to see that certain small towns are being inudated with more sludge than the town will generate in years.

It is possible that wastewater treatment plants face greater disposal costs (in the short term) if the wastewater treatment plant cannot landspread its sludge. But we need to ask ourselves, how many New Hampshire treatment plants actually face increased cost due to its inability to landspread sludge in a nearby town? Not many. How many New Hampshire treatment plants actually want to spread sludge in a nearby town? Not many.

Moreover, if a wastewater treatment plant has to spend extra monies to dispose of a smaller town's sludge (or an amount roughly equivalent to the amount of sludge a small town generates) then the wastewater treatment plant can explain the additional expense, and charge the smaller town additional fees to cover the increased cost of disposing the smaller town's sludge.

I recently attended a hearing on pending house bills and listened to an employee of a wastewater treatment plant explain that it is more costly to dispose of sludge if it cannot be landspread. In the short term, this may be true. However, what struck me was the apparent belief that the citizens of New Hampshire would prefer a less costly manner of disposing sludge, even if that cheaper mechanism carried a greater possibility of contamination. New Hampshire citizens have consistently shown, in polls, and in spirit, that they want to protect the environment, and that they consider protecting the environment one of the most important functions of government. I believe New

05/04/99 TUE 14:34 FAX 603 353 4567 Van Dorn & Cullenbers 002

Hampshire citizens would prefer a more expensive manner of waste disposal, if the environment is protected.

I know that I would rather pay substantially more to landfill sludge than to pay less to landspread sludge. I furthermore believe my fellow townspeople would agree. But without Senate Bill 218, smaller towns are not even given that option. Worse, we are being forced to accept material on our land that we strongly believe is not safe, especially as presently regulated. And the smaller towns are powerless to do anything about it if its wastewater treatment plant can exclude the town from using its facility.

Please vote in favor of Senate Bill 218. Thank you for your time and consideration.

Lara Saffo

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

# LOG OF ORAL COMMENTS RECEIVED, ENV-WS 800, SLUDGE MANAGEMENT RULES

**October 13, 1998**

| # | Commenter | Affiliation |
|---|---|---|
| **Morning Session, 9:00 a.m. to 12:00 noon** | | |
| 1 | John Loder<br>**806.08 - Metals limits** | Concerned citizen |
| 2 | Ann Bosiak<br>(see written comments) | Wheelabrator/ BioGro |
| 3 | Doug Bogen | Clean Water Action |
| | **A) 806.08, Metals limits** | |
| | **B) General, Out-of-state sludge** | |
| | **C) 806.08, Non-degradation** | |
| | **D) 806.08, Reduce Cu, Zn, Ni limits** | |
| | **E) 806.08, Reduce Cadmium limit** | |
| | **F) 806.08, Reduce Mercury limit** | |
| | **G) General, Fiscal Impact** | |
| 4 | Paul Ciccone | Monadnock Paper Mills |
| | **A) General, Rules encourage landfills** | |
| | **B) General, Excessive costs** | |
| | **C) 807.01, MSDS sheets** | |
| | **D) General, Inequity of rules** | |
| 5 | Helane Shields | Citizens for A Future N.H. |
| | **A) General, Out-of-state sludge** | |
| | **B) 807.05, Average spikes** | |

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|---|---|---|
| | **C) 807.05, Cyanide** | |
| | **806.07, Application rates** | |
| 6 | Amy Schaffer<br>**SPF over-regulated** | American Forest and Paper Association |
| 7 | Francesca Latawiec<br>(see written comments) | Office of State Planning |
| 8 | Dr. John Meinhold<br>(see written comments) | N.H. Sierra Club |
| 9 | Samuel Citron | Concerned citizen |
| | **A) 806.08, Surface water buffers** | |
| | **B) General, Rules too lax** | |
| 10 | Mike Townsend<br>**806.08, Science-based metals limits** | Tadmor Farm |
| 11 | Jim Dodge<br>**Rules limit availability of sludge** | Dodge Woodlands |
| 12 | Rep. Derek Owen | Merrimack County, District 6 |
| | **A) 806.02, 1-year permits** | |
| | **B) 806.01, Indemnification** | |
| | **C) General, Ethical standards** | |
| 13 | Virginia Johnson<br>**806.07, Concern about reclamations** | Concerned citizen |
| 14 | Jasen Stock<br>(see written comments) | BFI Organics |
| 15 | Henry Veilleux<br>(see written comments) | Business & Industry Association |
| 16 | Dr. Caroline Snyder<br>(see written comments) | Citizens For a Future N.H. |
| 17 | Bruce Kudrick<br>(see written comments) | Town of Hooksett |
| 18 | Riccardo Cantu<br>(see written comments) | City of Manchester |

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|---|---|---|
| 19 | Mike Stenkovich | City of Keene |
| | **A) General, Unfunded mandate** | |
| | **B) 806.08, 2001 limits as goals** | |
| | **C) General, Extend comment period** | |
| 20 | Jamie Sayen | Northern Appalachian Restoration Project |
| | **A) 807.05, Batch testing** | |
| | **B) General, Ecological impacts** | |
| | **C) General, Fiscal impact** | |
| | **D) General, Blue Ribbon Commission** | |
| 21 | Jack Petkus (see written comments) | City of Nashua |
| 22 | Dr. Edward Schmidt (see written comments) | Shevenell-Gallen |
| 23 | Ned Beecher (see written comments) | New England Biosolids & Residuals Assoc. |
| 24 | Linda Hartmann | Concerned citizen, Strafford |
| | **806.08, Buffers insufficient** | |
| | **806.07, Phosphorus management** | |
| 25 | Charley Hanson | White Mountain Resource Managment, Inc. |
| | **806.08, Cumulative load limits** | |
| | **General, Separate SPF from rules** | |
| 26 | George Hast **Pit Reclamation** | Tilton resident |
| 27 | Michael Farrell (see written comments) | Town Administrator, Hooksett |
| **Evening Session, 4:00 p.m. to 7:00 pm.** | | |
| 28 | Doug Steele (see written comments) | N.H. Water Pollution Control Association |

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|---|---|---|
| 29 | Jon Barrows<br>(see written comments) | N.H. Sierra Club |
| 30 | Denis Messier | Newington WWTP |
| 31 | Diane St. Germaine | Concerned citizen, Barnstead |
| | **A) General, Rules not protective** | |
| | **B) 801.02, Site permits for Class A** | |
| 32 | Larry Jackson<br>**Excessive costs** | Town of Littleton |
| 33 | David Ellenberger<br>(see written comments) | N.H. Sierra Club |
| 34 | Shelagh Connelly<br>(see written comments) | White Mountain Resource Managment, Inc. |
| 35 | John Hodsdon | Longridge Farm |
| | **General, Present rules adequate** | |
| | **806.07, Phosphorus management** | |
| 36 | Dick Flanders<br>(see written comments) | Plymouth Village Water & Sewer District |
| 37 | Alwynne Hellfach<br>(see written comments) | NEBRA, NHWPCA, end user |
| 38 | Lara Saffo | Concerned citizen, Haverhill |
| | **A) 807.05, Insuffient testing** | |
| | **B) 804.04, Hearing requirements lacking** | |
| | **C) 804.04, Public hearing response** | |
| | **D) 806.08, New England soils** | |
| Oral Comments Received After the Public Hearing | | |
| 39 | Rep. Leighton Pratt via phone on 8-20-98<br>**806.08 Metals limits** | House E&A Committee |
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# LOG OF WRITTEN COMMENTS RECEIVED, ENV-WS 800, SLUDGE MANAGEMENT RULES

October 13, 1998

| # | Commenter | Affiliation | Date |
|---|---|---|---|
| 1 | Dr. Carolyn Snyder | Citizens For A Future NH | 7-15-98 |
| | A) 801.01 Purpose | | |
| | B) 802.09 Stockpiling time | | |
| | C) 803.02 Notification | | |
| | D) 805.10 Hauler Records | | |
| | E) 806.11 Site Records | | |
| | F) 806.6 Surrounding land mapping | | |
| | G) 806.07 Agronomic rate, pH, anaerobic digestion | | |
| | H) 806.08 Incorporation | | |
| | I) 806.08 Grazing restrictions | | |
| | J) 806.07 Forest applications | | |
| | K) 806.08 Slope restrictions | | |
| | L) 806.08 Flood plain restrictions | | |
| | M,N, &O 806.08) Buffer distances | | |
| | P) 807.01 SQC information | | |
| | Q) 807.05 Sludge testing frequency | | |
| | R) 809.01 Waivers | | |
| | S) 807.05 Averaging test results | | |
| | T) 807.05 Organics risk methods | | |
| 2 | Mr. John Crosier<br>Extension of comment period | BIA | 7-22-98 |

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|---|---|---|---|
| 3 | Donald L. Ware, P.E. | Pennichuck Water Works | 7-22-98 |
| | **A&B) 808.08 Buffer distances** | | |
| | **C) 808.09 Lagoon Closure** | | |
| 4 | Ricardo Cantu<br>**806.08 IPP headworks loading** | City of Manchester | 7-24-98 |
| 5 | Douglas W. Steele | NHWPCA | 7-24-98 |
| | **A) Fiscal Impact** | | |
| | **B) 806.08 2001 Metal Limits** | | |
| | **C) Agricultural Use** | | |
| | **D) Gravel Pit Reclamation** | | |
| | **E) Inconsistent Standards** | | |
| | **F) DES Policy Contradiction** | | |
| 6 | Michael F. Farrell | Town of Hooksett | 7-24-98 |
| | **A) 806.08 2001 Metal Limits** | | |
| | **B) Fiscal Impact** | | |
| 7 | Jack Petkus, P.E. | City of Nashua | 7-24-98 |
| | **A) 806.08 2001 Metal Limits** | | |
| | **B) Extend Comment Period** | | |
| 8 | Thelma L. Hamilton | USEPA | 7-24-98 |
| | **A) 806.08 2001 Metal Limits** | | |
| | **B) 802.08 Disposal Definition** | | |
| 9 | Ann A. Bosiak | Wheelabrator/Bio Gro | 7-27-98 |
| | **A) Policy Change** | | |
| | **B) 806.08 Cumulative Metal Limits** | | |
| | **C) 807.05 Priority Pol. Loading** | | |
| | **D) Fiscal Impact** | | |
| | **E) Inequities** | | |

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|---|---|---|---|
| | **F) Fiscal Impact** | | |
| | **G) Extend Comment Period** | | |
| 10 | Dick Flanders | Plymouth Village Water & Sewer District | 7-27-98 |
| | **A) Community Burden** | | |
| | **B) 806.08 2001 Metal Limits** | | |
| | **C) 807.05 Testing** | | |
| | **D) Extend Comment Period** | | |
| 11 | Peter G. Russell | Town of Meredith | 7-27-98 |
| | **A) 801.01 Politics not Science** | | |
| | **B) 806.08 Copper Limit** | | |
| | **C) 806.08 Cumulative Load** | | |
| 12 | Jeffrey M. Taylor<br>Further Research | Office of State Planning | 7-27-98 |
| 13 | Edward J. Schmidt, P.E., Ph.D.<br>Risk Based Assessment | Shevenell-Gallen | 7-27-98 |
| 14 | David Ellenberger<br>Inadequate Regulations | NH Sierra Club | 7-27-98 |
| 15 | Henry Veilleux | BIA | 7-27-98 |
| | **A) Extend Comment Period** | | |
| | **B) 801.01 Purpose** | | |
| | **C) 806.08 Metal Limits** | | |
| | **D) 807.05 VOC Testing** | | |
| | **E) 805, 806 & 808.04, 807.02 Fees** | | |
| | **F) Impracticality** | | |
| | **G) 804.01 Unnecessary** | | |
| | **H) Fiscal Impact** | | |

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|---|---|---|---|
| 16 | Richard J. Corvinus<br>**806.08 Soil Types** | Town of Jefferson, Planning Board | 7-29-98 |
| 17 | Cynthia Wyatt | Branch Hill Farm | 7-26-98 |
| | **A) 801.01 Purpose** | | |
| | **B) Regulatory Inconsistency** | | |
| 18 | Rep. Harold Melcher | House E&A Committee | 8-3-98 |
| | **A) Extend Comment Period** | | |
| | **B) 806.08 2001 Metal Limits** | | |
| | **C) Currently Adequate** | | |
| | **D) 806.04, 807.02, 808.05 Expense** | | |
| 19 | David J. Ellenberger et al.<br>**Extend Comment Period** | N.H. Sierra Club | 7-23-98 |
| 20 | Doug Bogen<br>**Extend Comment Period** | Clean Water Action | 8-7-98 |
| 21 | John Crosier<br>**Extend Comment Period** | BIA | 8-7-98 |
| 22 | Alwynne Hellfach | self | 7-23-98 |
| | **A) 806.08 2001 Metal Limits** | | |
| | **B) Fiscal Impact** | | |
| | **C) Extend Comment Period** | | |
| 23 | Legislative Services - Admin. Rules | JLCAR | 8-4-98 |
| | **A) 803.01** Application accessibility | | |
| | **B) 806.12(f)** & **C)807.12(f)** Suspension | | |
| 24 | David Hess | Town of Hooksett | 8-6-98 |
| | **A) 806.08 2001 Metal Limits** | | |
| | **B) Fiscal Impact** | | |
| 25 | Marjory M. Swope<br>Line Comments | NH Assoc. Of Conservation Commissions | 8-19-98 |

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|---|---|---|---|
| 26 | Jay W. Chrystal | Monadnock Paper Mills, Inc. | 8-27-98 |
| | **A) Fiscal Impact** | | |
| | **B) Testing & Fee Inconsistency** | | |
| | **C) 801.02 Inconsistent Applicability** | | |
| | **D) 802.27 Sludge-Derived Product** | | |
| | E) **803.01(d)(5)** and **804.03(a)** conflict | | |
| | F) **805.04**, **806.04** Fees | | |
| | **G) 805.07 Vehicle Maintenance** | | |
| | **H) I) 805.08 Transportation of Sludge** | | |
| | **J) 805.11 Reporting** | | |
| | **K) 805.06 Vehicle Identification** | | |
| | **L) 806.07(i), (j) Pathogen Exemption** | | |
| | **M) 806.09(a) Covering** | | |
| | **N) 806.09(g) Stockpile BMPs** | | |
| | **O) 806.10(a) Metals Testing** | | |
| | **P) 806.10(c) Excessive Testing** | | |
| | **Q) 807.01(d) MSDSs** | | |
| | **R) 807.01(f) Dual Submittal** | | |
| | **S) 807.03(b) Pathogen Reduction** | | |
| | **T) 807.05(a)(2) Clarify Testing** | | |
| | **U) 807.05(a)(3) Available Data** | | |
| | **V) 807.05(b)(2)-(5) Analyte ID** | | |
| | **W) 807.05(b) Unreasonable Testing** | | |
| | **X) 807.05(b)(2),(3) Duplicate Analysis** | | |

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|---|---|---|---|
| | **Y) 807.05 Dioxin Test Method** | | |
| | **Z) 808.04(d) Unclear Fees** | | |
| | **AA) Policy Contradiction** | | |
| | **AB) 801.02(a) SPF Separation** | | |
| | **AC) 802.20 Reinstate Definition** | | |
| | **AD) 806.04(d) Clarify Fee Structure** | | |
| | **AE) 806.11(a) Generator Tracking** | | |
| | **AF) 807.05 Suggested Wording** | | |
| | **AG) 807.05(b) Test Method** | | |
| 27 | Eleanor P. Podles | The State Senate of New Hampshire | 8-17-98 |
| | A) **Fiscal Impact** | | |
| | B) **806.08 (o) 2001 Metal Limits** | | |
| | **C) DES Obligation** | | |
| | **D) Extend Comment Period** | | |
| 28 | Judy A. Silva | New Hampshire Municipal Assoc. | 9-1-98 |
| | A) **Fiscal Impact** | | |
| | B) **Unfunded Mandate** | | |
| 29 | Shelagh Connelly | NHWPCA & AFPA | 9-15-98 |
| | A) **NHDES Goal Contradiction** | | |
| | B) **"Biosolids"** | | |
| | C) **802.27 Sludge-Derived Product** | | |
| | D) **802.31 Very Poorly Drained Soils** | | |
| | E) **804.03(c) Final SQC** | | |
| | F) **805.08(d) Container storage** | | |
| | G) **805.08(f) Spill Control** | | |
| | H) **805.10(a)(3) Quantity Calcs.** | | |

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|---|---|---|---|
| | I) **806.01(e) Clarify Responsibility** | | |
| | J) **806.02(b)(1) Compliance Timing** | | |
| | K) **806.04 Simplify Fee Structure** | | |
| | L) **806.06(i) NRCS is Sufficient** | | |
| | M) **806.06(o) Excessive Information** | | |
| | N) **806.06(q) Redundant Requiremnt** | | |
| | O) **806.07(m)(2-4) UNH Regulating?** | | |
| | P) **806.08(c) Mixing while Tilling** | | |
| | Q) **806.08(g) Screening Compliance** | | |
| | R) **806.08(j) Posting** | | |
| | S) **806.08(k) Groundwater Permit** | | |
| | T) **806.08(p) Flawed Data-base** | | |
| | U) **806.09(c) Wellhead Protection** | | |
| | V) **806.09(f)Unnecessary Confinemnt** | | |
| | W) **806.09(g) Reactive Restrictions** | | |
| | X) **806.10(b) Soil Sample Timing** | | |
| | Y) **806.10(c) "mixture of sludge"** | | |
| | Z) **806.11(b) Metal Loading Calcs.** | | |
| | AA) **807.01(d) MSDS** | | |
| | AB) **807.01(f) DMR Submittal** | | |
| | AC) **807.05(a) Excessive Requiremnt** | | |
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| 30 | Douglas W. Steele II | NHWPCA | 8-31-98 |
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| 35 | John Meinhold, O.D.<br>**Radioactive Discharge Ordinance** | New Hampshire Sierra Club | 9/24/98 |
| 36 | Not Identified<br>**Conditions Warranting Restrictions** | New Hampshire Sierra Club | 9/24/98 |
| 37 | Caroline Snyder<br>**806.08(p) Dioxin Limits** | Citizens for a Future N. H. | 9/24/98 |
| 38 | Not Identified | New Hampshire Sierra Club | 9/24/98 |
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| 40 | James W. Ecker, P.E. | BFI, New England Residuals & Biosolids Group | 9-30-98 |
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| 48 | David G. Blanchette<br>**806.09 Discouraging SPF Beneficial Use** | Simpson Paper Company | 10-5-98 |
| 49 | Charley Hanson | White Mountain Resources Management, Inc. | 10-2-98 |
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| 53 | Grace Terpstra<br>"FiberClay" Misclassification | FiberClay Council | 9-29-98 |
| 54 | Darlene M. Johnson | New Hampshire Assoc. of Septage Haulers | 10-1-98 |
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# LOG OF WRITTEN COMMENTS RECEIVED ON THE FINAL PROPOSAL OF ENV WS-800

(Comment period Dec. 3 to Dec. 11, 1998)

| # | Commenter | Affiliation |
|---|---|---|
| 1 | Jeffrey H. Taylor | Office of State Planning |
| 2 | James A. Bailey | Warner Village Water District |
| 3 | Helane Shields | concerned citizen |
| 4 | Michael J. Hanscom | City of Concord |
| 5 | Earle M. Chesley, P.E. | Town of Merrimack |
| 6 | Amy Schaffer | American Forest & Paper Association |
| 7 | Douglas W. Steele II | N.H. Water Pollution Control Association |
| 8 | Ned Beecher | New England Biosolids & Residuals Association |
| 9 | Jasen Stock | BFI Organics |
| 10 | Lee Wilmot | BIA |
| 11 | Ann A. Bosiak | Wheelabrator Water Technologies, Bio Gro Div. |
| 12 | Joel Anderson | House Research, E&A Committee |
| 13 | Kurt Blomquist | City of Keene |
| 14 | Carolyn Snyder | Citizens For A Future N.H. |
| 15 | Diane St. Germaine | Citizens For A Future N.H. |
| 16 | Henry G. Veilleux | BIA |
| 17 | Lee R. Wilmot | Hadco |
| 18 | David L. Marceau | Certified Soil Scientist |

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**NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES**
**Env-Ws 800**
***Sludge Management***
**[April 1, 1999]**
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## CHAPTER Env-Ws 800 SLUDGE MANAGEMENT

Statutory Authority: RSA 485-A:4,XVI-~~a~~*b*; RSA 485-A:6,X-a

## PART Env-Ws 801 PURPOSE AND APPLICABILITY

Env-Ws 801.01 Purpose. ~~The purpose of these rules is to regulate the management of sludge to ensure that the beneficial use or disposal of sludge does not pose a threat to public health and safety by supplementing the requirements for the removal, transportation, and disposal of sludge found at 40 CFR Part 503.~~***These rules establish standards, criteria, and procedures for a permit system to manage the removal, transportation, and disposal of sludge in order to protect human health and the environment and to encourage beneficial use and recycling of sludge with appropriate performance standards.***

| Date of Entry | Initials | Rule Reference | Source of Comment |
|---|---|---|---|
| 8-18-98/9-15-98 | mwr / pmc | 801.01 Purpose | **Citizens #1w A** |
| **Comment:** The purpose section should include a reference to protection of human health and safety.<br>**Response:** Revised purpose statement. | | | |

| Date of Entry/Date of Response | Initials | Rule Reference | Source of Comment |
|---|---|---|---|
| 9-8-98 / 9-15-98 | rfp / gcb | 801.01 Purpose, Politics not Science | **Town of Meredith #11w A**, **BIA #15w B**, **Branch Hill Farm #17w A**, |
| **Comment:** The proposed changes are more of a political answer rather than of a scientific conclusion. They are a bit overboard in some areas. The proposed rules are severely flawed, and represent a response to a perceived risk, not rational, scientific response to real risks.<br><br>**Response:** We have made significant changes in the rules which address your concerns. | | | |

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.01 Performance Standards | **BFI #40w B**, |
| 10-1-98 | rfp | | | | |

**Comment:** Performance Standards for putrescibility would be redundant. If a material has the potential to become putrescible (according to normal definition of the term), it is already required to meet Class A or B criteria for vector control (EPA part 503).

**Response:** The rules will not contain a performance standard for putrescibility.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.01 Purpose, Inconsistent Applicability | **Monadnock #26w C,** |
| 9-10-98 | rfp | 10-16-98 | pmc | | |

**Comment:** There needs to be consistent "appropriateness" criteria applied to all materials regulated under this rule. Even though industrial sludges may meet the same land application standards or "safety standards" as POTW sludge, they are not afforded an industrial sludge exemption, when municipal sludge is.

**Response:** We have modified the rules so that there is consistent criteria for all types of sludge.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.01 Purpose | **MMSD #57w A,** |
| 10-21-98 | rfp | 10-30-98 | gcb | | |

**Comment:** This section is unclear as to how much supplemental regulation NH intends for Exceptional Quality biosolids fertilizers distributed and marketed by out-of-state POTWs such as Milorganite®. This section should plainly state, by adding words to the effect, that:

This Chapter ***adds supplemental standards for*** packaged exceptional quality biosolids fertilizers "subject to" regulation by another state National Pollutant Discharge Elimination System Permit which effectively enforces EQ quality compliance with Part 503.13 pollutant concentrations, Part 503.32 Class A pathogen and Part 503.33 vector attraction reduction requirements, ***only for parameters*** that U.S. EPA has not established national standards.

The MMSD assumes that DES intends to "supplement" the protection of Part 503 by requiring Milorganite® to comply with these specific supplemental state standards.

**Response:** If milorganite is distributed in New Hampshire in bags or containers of less than 100 pounds, they are exempt from our rules. Otherwise, they will need to obtain a sludge quality certification.

Env-Ws 801.02 Applicability.

(a) These rules shall govern ~~the removal, transportation, and disposal of sludge as defined by RSA 485-A:2,XI-a.~~ ***the removal and transportation of sludge derived from human waste which is not class A, the processing and storage of sludge, and land application of sludge.***

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 801.02(a) SPF Separation | **Monadnock #26w AB,** |
|---|---|---|---|---|---|
| 9-9-98 | rfp | 10-16-98 | pmc | | |

**Comment:** Revise statement by adding: except that rules applicable to wastewater treatment sludges from pulp and paper facilities are contained in Part Env-Ws 810. Regulations for Pulp and Paper Mill Sludges.

**Response:** Since all sludge is now going to be treated in the same manner, regardless of its origin, it is not necessary to have a separate section for pulp and paper mill sludges. Accordingly, we have not added the requested change.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02(a) Applicability | **BFI #56w A,** |
| 10-15-98 | rfp | 10-16-98 | pmc | | |

**Comment:** (a) These rules shall govern the management ~~removal, transportation, and disposal~~ of sludge generated by wastewater treatment facilities, as the term sludge is defined by RSA 485-A:2,XI-a, at, to or from sites or facilities in New Hampshire, as such management activities relate to the land application of sludge.

**General Comment: As proposed, these rules govern the removal, transportation and disposal of sludge. BFI Organics proposes the Department not include land application within the definition of disposal. BFI Organics strongly feels that sludge composting and land application are safe and environmentally responsible means of recycling these materials, and do not constitute "disposal."**

**Proposed Alternative: Landfill disposal of sludge and landfill design and operation using sludge or sludge derived products is already regulated and monitored by the solid waste section of the waste management division, and therefore should not be regulated under these proposed rules.**

**Response:** Revised purpose statement. Disposal is a term used in the statute and must be retained.

(b) These rules shall ***not*** apply to sludge which is ***disposed as a waste or otherwise used*** ~~stockpiled, used as a cap or intermediate cover, or to establish a vegetative cover~~ at a solid waste facility permitted by the waste management division of the department ~~of environmental services~~ pursuant to RSA 149-M.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02(b) Applicability | **BFI #56w B,** |
| 10-15-98 | rfp | 10-16-98 | pmc | | |

**Comment:** (b) These rules shall not apply to sludge which is stockpiled, used as an engineered component of the cap, liner or cover system ~~a cap or intermediate cover, or to establish a vegetative cover~~ at a solid waste facility permitted by the waste management division of the department ~~of environmental services~~ pursuant to RSA 149-M

**General Comment: The proposed rules require a permit for the use of sludge within the cap of a landfill. This is a redundant and impractical requirement for two reasons: 1) Landfill caps and closures are already regulated pursuant to the Solid Waste Rules by the Solid Waste Bureau, which must review and approve any alternative capping materials, including sludge. 2) Because landfill capping projects generally operate under tight time lines commencing in March (following Town Meeting) and the proposed permitting process for sludge applications can take up to four months, it would be very difficult if not impossible to obtain a permit and still meet the summer construction schedule.**

**Proposed Alternative: The responsibility for approving alternative capping materials should continue to reside with the Solid Waste Bureau.**

**Response:** Revised rules so that no permit is required for sludge used as landfill capping material.

(c) These rules shall not apply to sludge which is disposed ~~of as a waste in a landfill or~~ in an incinerator permitted by the department.

~~(d) These rules shall apply to the design, construction and operation but, except for sludge quality certification requirements specified in Env-Ws 807, shall not apply to the land application of sludge from a POTW or from a facility producing a sludge-derived product which meets all of the following:~~

~~(1) The pollutant concentrations contained in Env-Ws 806.08(m) or (o);~~

~~(2) The Class A pathogen reduction requirements contained in 40 CFR 503.32(a); and~~

~~(3) One of the vector attraction reduction requirements contained in 40 CFR 503.33(b)(1) through 503.33(b)(8).~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02 Site permits for Class A | **St. Germaine # o, N.H. Sierra Club #38w A,** |
| 8-27-98 | mwr | 10-16-98 | pmc | | |

**Comment:** Except for the reduced exposure to pathogens, class A sewage sludge contains the same contaminants as class B materials. Consequently, class A sludges should also be subject to site specific permitting requirements. This is particularly true in light of the fact that pathogen regrowth can occur in residuals such as compost, if they are improperly handled or stockpiled for extended periods of time.

**Response:** Class A sewage sludge will now be required to obtain a sludge quality certification.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02(c)(3) Permit by rule | **Biogro #41w C**, |
| 10-5-98 | rfp | 10-16-98 | pmc | | |

**Comment:** Does the permit-by-rule mean that you can undertake general distribution by providing your end-users or distributors with product use information? Or, does this mean, you have an expedited site licensure process? Requiring site licensure for any Class A/Exceptional Quality biosolids product will create such an economic disincentive to communities to invest in this level of technology.

**Response:** Permit-by-rule means general distribution with end use information and required BMPs

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02(d) Applicability | **BFI #56w C**, |
| 10-15-98 | rfp | 10-30-98 | gcb | | |

**Comment:** (d) These rules shall apply to the design, construction and operation of processing facilities as defined in Env-Ws 802.09 and sludge application sites as defined in Env-Ws 802.25, unless the sludge or sludge-derived product managed at the facility or site meets all of the following:

(1) The pollutant concentrations contained in Env-Ws 806.08(m)~~; or (o);~~

(2) The Class A pathogen reduction requirements contained in 40 CFR 503.32(a); and

(3) One of the vector attraction reduction requirements contained in 40 CFR 503.33(b)(1) through 503.33(b)(8).

**General Comment: Subsection (d) is missing words and requires clarification and redrafting, as noted above.**

**General Comment: As currently written, these regulations do not appear to apply to sludge from a POTW. BFI Organics and the USEPA believe that only sludges and sludge-derived products which do not meet criteria under 802.01(d)(1)-(3) require regulation to protect human health and the environment.**

**Response:** We have removed the section.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02(d) Applicability | **MMSD #57w C**, |
| 10-21-98 | rfp | 10-30-98 | gcb | | |

**Comment:** This section is poorly drafted. The plain language: "but, except" subjects Milorganite® to Part 807 Sludge Quality Certification Requirements and forces MMSD to apply for a waiver under Part 810, which is an unnecessary burden. Part 801.02(d)(1) by cross reference, loops the statistically derived Best Available within NH Biosolids Quality numeric limits of Part 806.08(m)(or the more stringent home state limits), (n) and (o), back into "exclusion." Part 807 makes no distinction between POTWs within NH and those outside the state. It is irrational not to distinguish between biosolids use and quality.

Create a Notice of Intent (NOI) Provision for Out-of-State EQ
A common feature of other newly adopted state biosolids regulations is to merely require a NOI to be submitted by Milorganite® for the Agency's review and approval of EQ distribution and marketing.

The new part for NOI/EQ should allow DES to require all useful or necessary information, e.g., same parameter testing as Part 807.05(b), and reporting as Part 807.06, without *over regulating*. MMSD supposes an NOI approval would require specific supplemental NH parameter limits for which Part 503 has not yet adopted a standard.

**Response:** We have deleted this section as it is no longer needed.

(e*d*) These rules shall not apply to any sludge management activity(ies) incidental to the operation of a wastewater treatment facility for which a surface water ***or a groundwater*** discharge permit has been issued by the department pursuant to RSA.485-~~C~~*A:13*.

~~(f) These rules shall not apply to any sludge management activity incidental to the operation of a wastewater treatment facility for which a groundwater permit has been issued by the department, pursuant to RSA 485-C.~~

(g*e*) Nothing in these rules shall be construed to modify or lessen the powers conferred upon local authorities by health and land use enabling statutes.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02(g) Local Authority | **White Mtn. RMI #49w E,** |
| 10-13-98 | rfp | 10-26-98 | gcb | | |

**Comment:** While local communities always have the option to adopt regulations more stringent than the state or federal rules, the encouragement by DES to do this is not necessary or appropriate. In fact, several communities have indicated that they feel pressured into adopting local restrictions or ordinances because of 801.02(g). In most ways, it would be far better for the DES to preempt local authority on these rules, as is done with the pesticide rules.

**Response:** We have not made the requested change as DES does not believe that local authority should be preempted on these rules.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.02(g) Applicability | **BFI #56w D,** |

| 10-15-98 | rfp | 10-26-98 | gcb | | |
|---|---|---|---|---|---|

**Comment:** ~~(g) Nothing in these rules shall be construed to modify or lessen the powers conferred upon local authorities by health and land use enabling statutes.~~

**General Comment: These rules are comprehensive and designed to be fully protective of human health and the environment. Accordingly, these rules should explicitly preempt local regulations with respect to all aspects of environmental and public health regulation as such local regulations may relate to activities regulated by these rules.**

**Proposed Language: Delete Env-Ws 801.02 (g)**

**Response:** We have not made your requested change as DES does not believe that local authority should be preempted for these rules.

(~~h~~*f*) Nothing in these rules shall be construed to eliminate the need to ~~also~~ comply with the federal regulations as specified in 40 CFR Part 503.

Env-Ws 801.03 Co-Disposal of Wastes. Solid or hazardous waste as defined in RSA 149-M or RSA 147-A, respectively, shall not be disposed ~~of as sludge~~ ***in a site or facility permitted by these rules***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 801.03 Confusing Implications | **Biogro #44w A,** |
| 10-5-98 | rfp | 10-26-98 | gcb | | |

**Comment:** This section is very confusing. It implies that any product defined under the solid waste statute (RSA 149-M) **or** the hazardous waste statute (RSA 147-A) cannot be disposed of as sludge. If sludge is land filled, then how does one dispose of a sludge subject to hazardous waste jurisdiction in a landfill?

The intent of this section is to ensure that: 1) the appropriate use for the appropriate product. It is appropriate to use a solid waste such as newspapers in a Class B biosolids land application project. It is not appropriate to land apply sludges that do not meet the stringent quality standards for land application or recycling programs.

Therefore, this section should be revised as follows:

**Env-Ws 801.03 Co-Disposal of Wastes. Solid wastes as defined in RSA 149-M shall not be disposed of as sludge without first obtaining all department approvals. Hazardous waste as defined in RSA 147-A shall not be utilized in land application programs with biosolids or sludge defined in these rules.**

**Response:** We have revised this section to clarify our intent not to have solid or hazardous waste disposed in a site or facility permitted by these rules.

**PART Env-Ws 802 DEFINITIONS**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802 "Biosolids" & "Short Paper Fiber" | **White Mtn. RMI #49w F,** |
| 10-13-98 | rfp | 10-26-98 | gcb | | |

**Comment:** The words *biosolids* and *short paper fiber* should be included in these rules to more accurately describe the materials being regulated under these rules. It is important for the public to understand what is truly being regulated, and what are suitable materials for recycling. The current use of the words "sludge" and "industrial sludges" are not accurate or precise.

**Response:** The definition of sludge is in the statute and, as such, cannot be changed. To add words to describe other types of sludge, we believe, would only cause more confusion. Accordingly, we do not propose to add these words.

Env-Ws 802.01 "Abutter" means any person who owns property adjacent to, or across a road, railroad, or stream from the property on which a sludge management activity will be conducted.

***Env-Ws 802.02 "Agronomic Rate" means the sludge application rate that is designed to:***

***(a) Provide the amount of nitrogen or other nutrient(s) needed by the crop, ~~or vegetation;~~ and***

***(b) Minimize the amount of nitrogen that passes below the root zone of the crop or the vegetation to the groundwater.***

Env-Ws 802.0~~2~~*3* "Applicant" means any person who applies to the department for a permit.

Env-Ws 802.0~~3~~*4* "Beneficial use" means taking advantage of the nutrient content and/or soil conditioning properties of sludge by supplying agronomic or soil conditioning benefits such as the nitrogen, phosphorus, micronutrients, or organic matter needs for:

(a) A crop;

(b) Forested land; or

(c) Establishing a vegetative cover for reclamation sites.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.04 "Biosolids" Definition | **NHASH #54w D,** |
| 10-15-98 | rfp | 10-27-98 | gcb | | |

**Comment:** We would like to see the definition of bio-solids either added or in conjunction with the sludge definition.

**Response:**See our response to White Mtn. RMI F concerning the same subject

Env-Ws 802.04*5* " ***In*** Bulk" means a sludge ~~or a sludge-derived product~~ that is ~~not sold or given away in a bag or other~~ ***distributed in a*** container ***of greater than 100 pounds***~~, excluding those used for hauling, for application to the land~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.04 "Bulk" Definition | **BFI #56w E**, |
| 10-15-98 | rfp | 10-26-98 | gcb | | |

**Comment:** Env-Ws 802.04 "Bulk" means a sludge or ~~a~~ sludge derived product that is not sold or given away in a bag or other container as the terms "bag" and "container" are defined in 40 CFR 503.11(j)~~, excluding those used for hauling, for application to the land.~~

**General Comment: Is there any size limit for bags or containers? Should "container" be defined?**

**Proposed Alternative: Use 40 CFR Part 503 definitions of "bag" and "container."**

**Response:** We have added a size limit for bags or containers.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.04 "Bulk" Definition | **MMSD #57w D**, |
| 10-21-98 | rfp | 10-26-98 | gcb | | |

**Comment:** MMSD has no objection to the current text because the definition of bulk use includes a reference to "bag or other container." In the context of biosolids regulations, "other container" has a special technical meaning. Part 503.11(j), defines "other container" as an open or closed receptacle including a carton, box, or pickup truck with a load capacity of one metric ton or less. The definition of "bulk" in 802.04 could be clarified and improved by a definition of "bag" or "container" consistent with 503.11(j).

In our business, "bulk" means 55 tons of Milorganite® in a *covered* rail hopper car. 1997 sales to NH distributors totaled 154 tons, or seven truck loads, all in 40 and 50 pound bags.

Milorganite® is shipped on one-ton pallets (50 forty pound bags) or in one-ton and one-half ton packages. a one-ton "bag" saves a golf course customer the labor of opening 40 fifty pound bags and avoids generating the solid waste from smaller empty bags.

Ten one-ton bags of Milorganite® shipped to a maintenance building for use and storage do not present a risk of abuse that is any different than ten forty pound bags purchased by a homeowner. There is no relationship between the size of the bag and risk. Risk does not increase with quantity when dealing with an EQ biosolids. It would be a mistake to define "bulk" in terms of small bags. We trust this will not be an outgrowth of the new draft rule.

**Response:** We have added a size limit for bags or containers.

***Env-Ws 802.06 "Class A sludge" means sludge derived from human waste which is Class A with respect pathogens under 40 CFR part 503.32(a) and which meets one of the vector attraction reduction requirements of 40CFR part 503.33(b)(1) through (b)(8).***

***Env-Ws 802.07 "Class B sludge" means sludge derived from human waste which is Class B with respect pathogens under 40 CFR part 503.32(b) and which meets one of the vector attraction reduction requirements of 40CFR part 503.33(b)(1) through (b)(8).***

Env-Ws 802.05~~8~~ "Closure" means the procedures used to cease the use of a facility, or a portion thereof, in a manner that will minimize future risks of environmental damage, and includes all required post-closure inspection, monitoring, and maintenance activities.

Env-Ws 802.06~~9~~ "CFR" means the code of federal regulations published by the office of the federal register, national archives, and records administration.

Env-Ws 802.07~~10~~ "Department" means the department of environmental services.

Env-Ws 802.08~~11~~ "Disposal" means the final discharge, deposit, injection, dumping, mixing, spilling, leaking, incinerating, or placing of sludge into or onto any land so that such sludge or any constituent ***there***of ~~it~~ may enter the environment, be emitted into the air or be discharged into any surface water or groundwater. ~~For the purpose of these rules,~~ ***D***isposal includes land application.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.08 Redefine "Disposal" | **USEPA #8w B**, |
| 9-4-98 | rfp | 9/15/98 | gcb | | |

**Comment:** The Department's definition does not support the beneficial use concept. Suggest to redefine so that land application is not disposal.

**Response:**As the statute only allows us to regulate the disposal of sludge, redefining the word "disposal" to exclude land application could, in effect, exempt all land application of sludge from the provisions of these rules.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.08 "Disposal" definition | **Biogro #44w B**, |
| 10-5-98 | rfp | 10-28-98 | gcb | | |

**Comment:** This definition is overly broad. Disposal methods for biosolids include technologies such as incineration and landfilling. Recycling programs such as direct land application, composting or pelletizing are not disposal and are already defined as beneficial use. Including recycling options under the definition of disposal perpetuates the negative public perception that these environmentally sound options for end use have the same long-term implications as land filling or incineration. **Therefore, the original language of Env-Ws 802.08 should be retained.**

**Response:** See our response to US EPAs comments concerning the same subject.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.08 "Disposal" Definition | **White Mnt. RMI #49w I,** |
| 10-13-98 | rfp | 10-30-98 | gcb | | |

**Comment:** "Disposal" should not, for the purposes of this rule, include land application.

**Response:** See our response to US EPA's comments concerning the same subject.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.08 "Disposal" Definition | **BFI #56w F,** |
| 10-15-98 | rfp | 10-30-98 | gcb | | |

**Comment:** Env-Ws 802.08 "Disposal" means the final discharge, deposit, injection, dumping, mixing, spilling, leaking, incinerating, or placing of sludge into or onto any land so that such sludge or any constituent of it may enter the environment, be emitted into the air or be discharged into any surface water or groundwater. For the purpose of these rules, disposal does not include land application or beneficial use. ~~includes land application.~~

**General Comment: See same comment as 801.02(a).**

**General Comment: These rules govern the removal, transportation and disposal of sludge. BFI Organics proposes the Department not include land application within the disposal definition. BFI Organics strongly feels that sludge composting and land application are safe and environmentally responsible means of recycling these materials.**

**Response:** See our response to US EPA's comments concerning the same subject.

Env-Ws 802.~~09~~*12* "Facility" means a location or system for ~~(a) S~~storing sludge for longer than 8 months; or *for* ~~(b) T~~*t*he processing, treatment, or disposal of sludge, other than land application. ~~For purposes of this chapter, f~~*F*acilities include, but are not limited to, lagoons, sludge treatment facilities, sludge ~~only landfills~~ ***monofills***, and sites where sludge is treated or mixed with other sludge or other material for shipment off site.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.09 Facility Definition | **Citizens #1w B,** |
| 8-27-98 | mwr | 10-30-98 | gcb | | |

**Comment:** Increasing the stockpiling period from 6 to 8 months is less protective. It allows greater exposure to water and more environmental damage. Other states are protective in terms of stockpile management.

**Response:** We have not increased the stockpiling period. The existing rules allow sludge to be stockpiled for any length of time. We are only requiring that a person who proposes to stockpile sludge for greater than 6 months, but less than 8 months, would now have to obtain a site permit, rather than a facility permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.09 "Facility" Definition | **BFI #56w G,** |
| 10-15-98 | rfp | 10-30-98 | gcb | | |

**Comment:** (b) The processing, treatment, or disposal of sludge, other than land application. For purposes of this chapter, facilities do not include disposal, processing or treatment facilities already permitted by the department. ~~but are not limited to, lagoons, sludge treatment facilities, sludge only landfills, and sites where sludge is treated or mixed with other sludge or other material for shipment off site.~~

**General Comments: The proposed definition is too broad and could include other "facilities" (e.g. solid waste landfills, or aeration lagoons already permitted).**

**Response:** Since we have already excluded solid waste landfills and aerated lagoons from the requirements of these rules, it is not necessary to modify this section.

***Env-Ws 802.13 "Floodway" means the regulatory floodway, which is adopted into the municipal flood-plain management ordinance, is the stream channel plus that portion of the overbanks that must be kept free from encroachment in order to discharge the 1-percent annual chance flood without increasing flood levels by more than 1.0 foot.***

Env-Ws 802.~~10~~*14* "Generator" means the person who holds title to the water or wastewater treatment facility that produced the sludge or the person who uses that sludge to produce another material.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.10 "Generator" Definition | **BFI #56w H,** |
| 10-15-98 | rfp | 10-26-98 | gcb | | |

**Comment: As proposed, BFI Organics will become the generator of any sludge mixture (i.e., BioMix™ Soil) manufactured at a site or facility. BFI Organics supports this change.**

**Response:** No response necessary

Env-Ws 802.1~~1~~*5* "Governing body" means the board of selectmen in a town, the board of aldermen or council in a city, or town with a town council, or when used to refer to unincorporated towns or unorganized places, or both, the county commissioners.

Env-Ws 802.12~~6~~ "Hauler" means any person engaged in the removal or transportation of sludge.

Env-Ws 802.13~~7~~ "Industrial wastewater" means wastewater generated from a commercial or industrial process.

Env-Ws 802.14~~8~~ "Lagoon" means a pit or excavation designed to receive sludge.

Env-Ws 802.15~~9~~ "Land application" means the placement of sludge on the ground surface for beneficial use, whether or not the material is incorporated or injected into the soil.

***Env-Ws 802.20 "Locally accessible place" means a location, in the town or municipality where the sludge management activity is proposed, that has public access. Such locations include the town hall, school building, selectman's office or the public library.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.20 "Locally Accessible" Added Definition | **P. Adams #33w A,** |
| 10-12-98 | rfp | 10-17-98 | gcb | | |

**Comment:** "Locally Accessible Place" means a town or municipality location with public access; a public place; a town hall, selectman's office or public library; the location where announcements of public hearings, town meetings and other public happenings are posted.

REASON: 803.01(d)(7) identifies "a locally accessible place".. As the repository of site and facility applications for local review. Should a person in Pittsburgh, NH be require to travel to Concord, NH to perform a "local review"? I would think not, but this seems to be the case today as local governments do not have on hand the required information for such review.

**Response:** Added the definition of locally accessible place.

Env-Ws 802.16~~21~~ "Management" or "manage" means the practice of supervising, controlling, or undertaking any sludge activity(ies) regulated under these rules, including transporting, land applying, stockpiling, treating~~;~~ ***or*** processing, ~~or disposing~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.16 "Management" Definition | **BFI #56w I,** |
| 10-15-98 | rfp | 10-25-98 | gcb | | |

**Comment:** Change: ...stockpiling, treating or processing~~; or disposing~~.

**Response:** Revised the definition

Env-Ws 802.17~~22~~ "Operator" means the person responsible for managing the sludge activity***(ies)*** at a site, facility, or wastewater treatment facility.

Env-Ws 802.~~18~~*23* "Owner" means the person who holds title to the land on which sludge is ***managed*** or is proposed to be managed.

Env-Ws 802.~~19~~*24* "Permit" means the written document issued by the department which authorizes the holder to ~~operate~~***manage*** the site or facility or to use the ~~identified container and vehicle~~ ***motorized unit*** to remove and transport sludge according to the terms of the document.

***Env-Ws 802.25 "Permit holder" means the individual to whom a permit has been issued by the department.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.25 Reinstate Definition | **Monadnock #26w AC**, |
| 9-3-98 | rfp | 9-9-98 | gcb | | |

**Comment:** "Permit holder' means any person who has been issued a permit by the Department." Though this definition was stricken in the annotated version, it should be reissued since he term still appears throughout the text.

**Response:** Added permit holder definition.

Env-Ws 802.2~~0~~*6* "Person" means "person" as defined by RSA 485-A:2,IX, namely "any municipality, governmental subdivision, public or private corporation, individual, partnership, or other entity."

Env-Ws 802.2~~1~~*7* "Poorly drained" means a type of soil where ~~the presence of water in the soil comes within 12 inches of the soil surface~~ ***water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains for long periods. The occurrence of internal free water is shallow or very shallow and common or persistent. Free water is commonly at or near the surface long enough during the growing season so that most mesophytic crops can be grown, unless the soil is artificially drained. The soil is not continuously wet directly below plow depth. Free water at shallow depth is usually present. This water table is commonly the result of a slowly pervious layer of seepage, of nearly continuous rainfall, or of a combination of these.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.21 "Poorly drained" definition | **Biogro #44w C**, |
| 10-5-98 | rfp | 10-22-98 | gcb | | |

**Comment:** This definition is vague and overly broad. There is probably not a single soil type which does not have "the presence of water in the soil". A soil analysis will always detect moisture in the top layer (3-12") of the soil and that is not indicative of water table conditions.

The NRCS, which is charged with mapping and characterizing soil types and drainage classes of the various soil types, should be the reference for soil classification definitions. This information is already available to land owners, agricultural and land use advisors through the various NRCS county soil surveys and publications. **Therefore, the following language should be added:**

**Env-Ws 802.21 "Poorly drained" means a type of soil as defined by the NRCS as having a drainage classification as poorly drained.**

**Response:** Revised the definition to the NRCS Soil Manual definition

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.21 "Poorly Drained" | **P. Adams #33w B,** |
| 10-12-98 | rfp | 10-22-98 | gcb | | |

**Comment:** Inadequate definition. Refer to Corps of Engineers Wetland Delineation manual (Jan. 1987 or current edition) or NHDES Wetlands personnel for appropriate, more complete definition.

**Response:** Revised the definition to the NRCS Soil Manual definition

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.21 "Poorly Drained" and "Very Poorly Drained" Definitions | **NHASH #54w C,** |
| 10-15-98 | rfp | 10-22-98 | gcb | | |

**Comment:** We would rather the Department uniformly use the same definitions throughout all DES departments and their policies.

**Response:** Revised the definition to the NRCS Soil Manual definition

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.21 "Poorly Drained" Definition | **BFI #56w J,** |
| 10-15-98 | rfp | 10-22-98 | gcb | | |

**Comment:** Env-Ws 802.21 "Poorly Drained" means a soil where water is removed so slowly that the soil is saturated or remains wet for longer than 4 consecutive months. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these. ~~type of soil where the presence of water in the soil comes within 12 inches of the soil surface.~~

**General Comment: The Department defines a "poorly drained soil" as any soil where the presence of water within the soil comes to within 12 inches of the soil surface. This definition is ambiguous and should be consistent with the technical term as used by the Soil Conservation Service (SCS).**

**Proposed Alternative: Use the SCS's technical term and when establishing operating criteria the Department should take into consideration site specific characteristics (e.g.,, allow sludge stockpiling at sites with poorly drained soils during dry periods of the year).**

**Response:** Revised the definition to the NRCS Soil Manual definition.

Env-Ws 802.22~~8~~ ~~"POTW" or~~ "p*P*ublicly owned treatment works ***(POTW)***" means a wastewater treatment facility which is owned by a municipality or other governmental agency or subdivision.

Env-Ws 802.23~~9~~ "Processing" means any activity to reduce the quantity of sludge or alter its chemical, biological, or physical state. Processing does not include ~~ph adjustment of sludge~~ ***the alteration of a sludge's chemical, biological, or physical state solely*** for the purpose of odor control.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.23 "Processing" Definition | **BFIw #56 K,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Env-Ws 802.23 "Processing" means any activity to reduce the quantity of sludge or alter its chemical, biological, or physical state. Processing does not include the alteration of a sludge's chemical, biological, or physical state solely ~~pH adjustment of sludge~~ for the purpose of odor control.

**Response:** Revised the definition to clarify our intent.

Env-Ws 802.24~~30~~ "Reclamation" means the addition of organic matter and nutrients to improve and/or promote establishment of vegetation on soils which have been severely disturbed or which are in a poor vegetative state.

Env-Ws 802.25~~31~~ "Site" means a contiguous land area*s* owned by the same person(s), on which sludge is stockpiled for 8 months or less or land applied, even if the land area is divided by a highway, railroad bed, water body, or boundary of a political subdivision.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.25 "Site" definition | **Biogro #44w D**, |
| 10-5-98 | rfp | 10-26-98 | gcb | | |

**Comment:** For agricultural operations, this definition is overly restrictive and will create a barrier to a successful state land application program, since it will split up land units that are managed as one agricultural operation. Farmers may own, lease or rent multiple parcels that are managed as a single operation. Not treating such an agricultural operation as one site makes it difficult for the farm operator to track biosolids management activities. It is the farm operator in these cases, not the landowner, who has primary responsibility for compliance with required biosolids management practices, such as waiting periods before livestock grazing or the harvesting of certain crops. The actual landowner of rental ground has little or no involvement or responsibility for the day to day agricultural management of the site. In addition, this requirement is a disincentive to beneficial use since multiple site permits and fees must be paid for the land application of biosolids to a single agricultural operation. **Therefore, the definition of a site should be rewritten as follows:**

**Env-Ws 802.25 "Site" means: (a) for reclamation and forestry, a contiguous land area owned by the same person(s); and (b) for agricultural areas, contiguous and non-contiguous land areas under the management of one person(s) as a single farming operation.**

To ensure that the landowner of each parcel designated for biosolids land application within an agricultural operation consents to the use of biosolids to their property, and agrees to abide by the conditions of the permit and state rules, a "Landowner Consent Form" should be required as part of the site permit application. If parcels under the management of one farm operator are located in more than one township, each town and abutters of each parcel designated for biosolids land application should receive public notice.

**Response:** We have not modified the definition of site as we believe that each "site" should receive a separate permit.

Env-Ws 802.~~26~~*32* "Sludge" means "sludge" as defined by RSA 485-A:2,XI-a, namely "the solid or semisolid material produced by water and wastewater treatment processes, provided, however, sludge which is disposed at solid waste facilities permitted by the ~~waste management division of the~~ department ~~of environmental services~~ shall be considered solid waste and regulated under RSA 149-M." ~~For purposes of this chapter,~~ ~~s~~Sludge ~~includes sludge from any wastewater treatment facility as defined in Env-Ws 802.32. It~~ also includes sludge mixed with another sludge or another material~~, but does not include sludge-derived products~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.26 "Sludge" definition | **Biogro #44w E**, |
| 10-5-98 | rfp | 10-26-98 | gcb | | |

**Comment:** This statutory definition of sludge is very broad. It includes a wide variety of products that are currently integrated in the marketplace that do not involve land application or composting. Under this definition, food wastes that are the result of wastewater treatment at processing facilities would be subject to these rules. Many of these food waste products are used as food stocks for animal feed (ex. brewer's yeast as grain source for cows). For these uses, it is not appropriate nor necessary to require the testing protocols that are included for land application programs. **Therefore, the definition of sludge that is subject to these rules (land application or processing for use on the land) should be amended to clarify what sludges are subject to these regulations.**

**Response:** We have revised the applicability section to address your comments.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.26 Use of "Sludge" or "Biosolids" | **White Mnt. RMI #49w G,** |
| 10-13-98 | rfp | 10-26-98 | gcb | | |

**Comment:** Wherever the word "sludge" is used to describe "*the nutrient rich organic solids resulting from the treatment of municipal wastewater that meet the federal and state standards for use on land*", then the word "biosolids" should replace the word "sludge" in this rule.

**Response:** See our response to White Mtn. RMI F concerning the same subject

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.26 Use of "Industrial Sludge" or "Short Paper Fibers" | **White Mnt. RMI #49w H,** |
| 10-13-98 | rfp | 10-26-98 | gcb | | |

**Comment:** Wherever the words "industrial sludge" are used to describe "*the organic residual solids resulting from the treatment of papermill wastewater that meet the federal and state standards for use on land*", then the words "short paper fiber" should replace the words "industrial sludge" in this rule.

**Response:** See our response to White Mtn. RMI F concerning the same subject.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.26 "Sludge" Definition | **BFI #56w L,** |
| 10-15-98 | rfp | 10-26-98 | gcb | | |

**Comment:** The definition of sludge is too broad because it includes water and wastewater treatment processes, but for purposes of these rules should be restricted solely to wastewater treatment processes. BFI Organics addresses this concern in its proposed revisions to Env-Ws 801.02(a). Also, these rules must clarify the distinction between sludge and sludge-derived products such as BioMix™ Soil.

**Response:** As the definition of sludge is in statute, it cannot be changed. Relative to your comment concerning sludge-derived products, we have removed the reference to sludge derived products as it is no longer needed.

~~Env-Ws 802.27 "Sludge-derived product" means a marketable material sold or given away in bags or in bulk which has been derived from sludge by a treatment or process such that the product derived is no longer the direct by-product of wastewater treatment, but is significantly changed in terms of its physical, chemical, and biological properties. Processed sludge which meets the following requirements would be deemed a sludge-derived product:~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.27 "Sludge-derived product" Definition | **BFI #56w M**, |
| 10-15-98 | rfp | 10-21-98 | gcb | | |

**Comment:** "Sludge-derived product" means a marketable material sold or given away in bags or in bulk which has been derived from sludge by a treatment or other process such that the product derived is no longer the direct by-product of wastewater treatment, but is significantly changed in terms of its physical, chemical, or ~~and~~ biological properties. All sludge-derived products must meet the metals requirements in Table 1 of 40 CFR 503.13. In addition to the metal requirements in Table 1 of 40 CFR 503.13 sludge derived products derived from sludges containing pathogens must also meet the following requirements: ~~Processed sludge which meets the following requirements would be deemed a sludge-derived product:~~

~~(a) The metals requirements in Env-Ws 806.08(m) or (o);~~

(a~~b~~) One of the following treatment methods specified in 40 CFR Part 503:

(1) 503.32(a)(1)-(8); or

(2) 503.32, Appendix B; and

(b~~e~~) One of the vector attraction reduction options specified in 40 CFR 503.33(b)(1) through 503.33(b)(8).

**General Comment: BFI Organics proposes the Department base all regulatory standards on peer reviewed, risk-based research and not regulate class A sludges and sludge products. The department should also make allowances for sludge derived products produced from sludges not containing pathogens.**

**Response:** Removed the definition of sludge-derived product as it is no longer needed

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.27 "Sludge-Derived" Definition | **MMSD #57w E**, |
| 10-21-98 | rfp | 10-23-98 | pmc | | |

**Comment:** Unlike Part 503 and all other state biosolids regulations we are familiar with, NH Env-Ws Chapter 800 does not use different classes or types of biosolids based on the three quality parameters. Thus the regulations are quite different and difficult to understand. Management practices and general site control practices never apply to Class A/EQ biosolids. However good management practices at the site when Class B biosolids are applied and incorporated into the soil are essential to protect public health and the environment from reasonably anticipated adverse effects.

Chapter 800 appears to use the term "sludge-derived" as a synonym for Class A/EQ quality. The definition conflicts with the use of the same term in Part 503.10. Milorganite® can be mixed with any other organic or inorganic fertilizer without subjecting the resulting product to unnecessary regulation as sewer sludge. Milorganite® is sometimes blended with other commercial fertilizers for resale and special uses. The resulting blend is a "sludge-derived product" in Part 503.10(d) & (g) and exempted from the biosolids land application regulations, Subpart B of Part 503.

If "sludge-derived product" is intended to describe EQ biosolids, then use the defined term "biosolids" instead.

**Response:** Removed the definition of sludge derived product as it is no longer needed.

~~(a) The metals requirements in Env-Ws 806.08(m) or (o);~~

~~(b) One of the following treatment methods specified in 40 CFR Part 503:~~

~~(1) 503.32(a)(1)-(8); or~~

~~(2) 503.32, Appendix B; and~~

~~(c) One of the vector attraction reduction options specified in 40 CFR 503.33(b)(1) through 503.33(b)(8).~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.27 "Sludge-Derived Product" | **Monadnock #26w D,** |
| 9-10-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Clarify how the "Sludge-Derived Product" definition and criteria would apply to materials, particularly pulp and paper mill sludges, that are given, sold or otherwise used as a feed stock for products other than soil amendments. As was stated at one of the BIA working sessions, "how will this material be regulated when industry gets "creative" in its use?

**Response:** Removed the definition of sludge-derived product as it is no longer needed

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

22

| date | initials | date | initials | 802.27 Sludge-Derived Product Def. | **NHWPCA #29w C,** |
|---|---|---|---|---|---|
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The definition should be expanded to include products such as short paper fiber, which have low trace metal contents and are not treated to kill pathogens, because they are not derived from the treatment of domestic wastewater.

**Response:** Removed the definition of sludge-derived product as it is no longer needed

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.27 "Sludge-derived-product" definition | **Biogro #44w F,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** As stated in the comment above for the definition of sludge, this definition would include products from numerous sludges that are the result of wastewater treatment process, but are not used in land application programs. The testing standards and analysis are not applicable to products not being used in a land application programs such as food wastes like brewer's yeast. **Therefore, this definition needs to be amended in accordance with the sludge definition changes.**

**As a point of clarification, section (b) should be revised to include the appropriate reference to "pathogen" treatment under the sections of the 503 regulations cited.**

**Response:** Removed the definition of sludge-derived product as it is no longer needed

Env-Ws 802.~~28~~*33* "Stockpiling" means the storage of sludge.

Env-Ws 802.~~29~~*34* "Surface water" means "surface waters of the state" as defined by RSA 485-A:2, XIV, namely "streams, lakes, ponds and tidal waters within the jurisdiction of the state, including all streams, lakes, or ponds bordering on the state, marshes, water courses and other bodies of water, natural or artificial." Surface water includes wetlands ~~and very poorly drained soils~~, but do*es* not include non-tidal drainage ditches which were designed, built, and used to convey wastewater or stormwater. It also does not include constructed wetlands, lagoons, and other treatment systems designed and built solely as wastewater or stormwater treatment systems provided such facilities were not initially constructed in waters of the state or were not constructed to serve other mitigation purposes.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.29 "Surface waters" definition | **Biogro #44w G,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** The Department's definition of surface water to include areas of poorly drained soils is not accurate and conflicts with standard soil definitions. Very poorly drained soils have a specific definition and classification criteria which has been developed by the NRCS, which is charged with mapping and developing soil type classifications and drainage definitions. Including very poorly drained soils in the surface water definition is inappropriate and overly broad. These soils do not require the same type of buffers as a year round surface water body because of seasonal changes in the soil conditions. Any concerns about ground water quality can be addressed in the management plan. **Therefore, the reference to very poorly drained soils as being defined as a surface water should be deleted.**

**Response:** Revised the definition to exclude very poorly drained soils.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.29 "Surface waters" definition | **BFI #56w N,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** "Surface water" means "surface waters of the state" as defined by RSA 485-A:2, XIV, namely "streams, lakes, ponds and tidal waters within the jurisdiction of the state, including all streams, lakes, or ponds bordering on the state, marshes, water courses and other bodies of water, natural or artificial." Surface water ~~includes wetlands and very poorly drained soils but do~~ does not include non-tidal drainage ditches which were designed, built, and used to convey wastewater or stormwater~~;~~. ~~It also does not include~~ constructed wetlands, lagoons, and other treatment systems designed and built solely as wastewater or stormwater treatment systems provided such facilities were not initially constructed in waters of the state or were not constructed to serve other mitigation purposes.

**General Comment: BFI Organics does not agree with the Department's inclusion of very poorly drained soils within the definition of surface water. Because land application sites will have multiple soil types, requiring a surface water setback from a very poorly drained soil will unnecessarily preclude land application on surrounding suitable soils. See comment on Env-Ws 802.31.**

**Proposed Alternative: Delete wetlands and very poorly drained soils from this definition.**

**Response:** Revised the definition to exclude very poorly drained soils.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.30 "Transfer" Definition. | **BFI #56w DC,** |
| 10-15-98 | rfp | 11-5-98 | gcb | | |

**Comment:** Env-Ws 802.30 "Transfer" means, depending on the context in which it is used:

(a) The conveyance of a fee simple interest in real estate; or

(b) A change in the ownership or operational control of an entity holding a permit, or a change in an individual holding a permit as follows:

(1) For a partnership, a change in the majority of general partners;

(2) For a corporation, the conveyance of all corporate assets or of a majority of voting shares to a new individual or entity;

(3) For other organizations, a transfer of the control of the organization to a new individual or entity; and

(4) For an individual, transfer of control to another individual or entity.

The term includes "sale" and "assignment."

**General Comment: The terms "transfer," "sale" and "assignment" appear in Env-Ws 804.06 and 804.07 but are not defined. BFI Organics proposes to define these terms in a manner consistent with the definition of "transfer" in the NH Solid Waste Rules. (See Env-Wm 102.169)**

**Response:** We have added the definition.

***Env-Ws 802.35 "Transfer" means:***

***(a) The conveyance of a fee simple interest in real estate; or***

***(b) A change in the ownership or operational control of an entity holding a permit, or a change in an individual holding a permit as follows:***

***(1) For a partnership, a change in the majority of general partners;***

***(2) For a corporation, the conveyance of all corporate assets or of a majority of voting shares to a new individual or entity;***

***(3) For other organizations, a transfer of the control of the organization to a new individual or entity; and***

***(4) For an individual, transfer of control to another individual or entity.***

Env-Ws 802.3~~0~~6 "Vector" means a carrier that is capable of transmitting a pathogen from one organism to another, including but not limited to flies and other insects, rodents, birds, and other vermin.

Env-Ws 802.3~~1~~7 "Very poorly drained" means a type of soil where ~~the presence of water occurs~~

~~at or above the soil surface~~ ***water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season. The occurrence of internal free water is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. If rainfall is high or nearly continuous, slope gradients may be greater.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.31 Very Poorly Drained Soils Definition. | **NHWPCA #29w D,** |
| 9-23-98 | rfp | 10-22-98 | gcb | | |

**Comment:** Many soils that are not very poorly drained will have water present at the soil surface for short periods of time during any given year. The definition of poorly drained soil should refer to "Field Indicators for Identifying Hydric Soils in New England".

**Response:** Revised the definition to the NRCS Soil Manual definition.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.31 "Very poorly drained" definition | **Biogro #44w H,** |
| 10-5-98 | rfp | 10-22-98 | gcb | | |

**Comment:** This definition is vague and overly broad. According to this definition, puddles in a field following a rain storm would be a very poorly drained soil.

The NRCS, which is charged with mapping and characterizing soil types and drainage classes of the various soil types should be the reference for soil classification definitions. This information is already available to landowners, agricultural and land use advisors through the various NRCS county soil surveys and publications. **Therefore, the following language should be added:**

**Env-Ws 802.31 "Very poorly drained" means a type of soil as defined by the NRCS as having a drainage classification as very poorly drained.**

**Response:**Revised the definition to the NRCS Soil Manual definition.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.31 "Very Poorly Drained" | **P. Adams #33w C,** |
| 10-12-98 | rfp | 10-22-98 | gcb | | |

**Comment:** Inadequate definition. Refer to Corps of Engineers Wetland Delineation manual (Jan. 1987 or current edition) or NHDES Wetlands Personnel for appropriate, more complete definition.

**Response:**Revised the definition to the NRCS Soil Manual definition.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 802.31 "Very Poorly Drained" Definition | **BFI #56w O,** |
| 10-15-98 | rfp | 10-22-98 | gcb | | |

**Comment:** "Very poorly drained" means a type of soil where the water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, in locations where rainfall is high and nearly continuous, they can have moderate or high slope ~~gradients. presence of water occurs at or above the soil surface.~~

**General Comment: The Department defines a "Very poorly drained soil" as any soil where the presence of water occurs at or above the soil surface. This definition is ambiguous and should be consistent with the technical term as used by the Soil Conservation Service (SCS).**

**Proposed Alternative: Use the SCS's technical term and when establishing operating criteria the Department should take into consideration site specific characteristics (i.e., allowing land application within 10 meters of very poorly drained soils during dry periods of the year).**

**Response:**Revised the definition to the NRCS Soil Manual definition.

Env-Ws 802.3~~2~~*8* "Wastewater treatment facility" means~~, for purposes of these~~ a ~~plant or~~ group of devices provided for:

(a) The treatment of domestic or industrial wastewater, or both;

(b) The dewatering ~~and handling~~ of sludge removed from such wastewater;

(c) The treatment of septage; or

(d) Any combination of (a) through (c) above.

**PART Env-Ws 803 REQUIREMENTS FOR NOTIFICATION**

Env-Ws 803.01 Notification Requirements for Site and Facility Permits.

(a) ~~A person~~ ***The applicant*** shall provide notice in accordance with this section upon filing an application with the department for a site or facility permit.

(b) The notice shall be provided to:

(1) The governing body of the municipality in which the proposed site or facility is located and the governing body of any adjacent municipality in which an abutter is located;

(2) All abutters to the proposed site or facility ***as such abutters and their respective legal mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c)***;

(3) All other landowners within 500 feet of the area on which the activity will occur ***as such landowners and their respective mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c)***; and

(4) The department.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.01 Impact Area | **White Mnt. RMI #49w J**, |
| 10-13-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Limit the notification to the "impact area". Notifying abutters who may be nowhere near a site is not appropriate, expensive, and prohibitive to some landowners. For instance, in Belmont one farmer chose not to go through with a project because his property was so large it would require notifying over four hundred people, most of which lived more than two miles from the actual field to be spread. This seems to be an unnecessary and burdensome requirement which is not achieving the stated goal or purpose of informing those who may be impacted by an activity regulated under these rules. It would be more useful to *require notification of all abutters within 500 feet of any proposed activity.*

**Response:** We do not believe in limiting the notification to abutters. Accordingly, we have not included your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.01 Abutters | **BFI #56w P**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (2) All abutters to the proposed site or facility, as such abutters and their respective legal mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c), ~~to the proposed site or facility~~;

(3) All other landowners within 500 feet of the area on which the activity will occur as such landowners and their respective mailing addresses are identified in the municipal tax records as of the close of business on the day before the date on which notice is provided pursuant to Env-Ws 803.01(c); and

(4) The department.

**General Comment: This section requires additional specificity in order to avoid potential confusion and misunderstanding with respect to the obligation to ascertain the identity of the legal owner(s) of properties.**

**Response:** We have revised the section to incorporate your suggested language.

(c) The notice shall be:

(1) In writing; and

***(2) Delivered by one of the following methods:***

~~(2)~~***a.*** Sent by certified mail, return receipt requested; ~~or~~

~~(3)~~***b.*** Delivered by hand, in which case a signed acknowledgment from the recipient that the notice was received shall be obtained; or

~~(4)~~***c.*** Sent by first class mail, in which case a certificate of mailing shall be obtained from the United States post office at which the notices were mailed.

(d) The notice shall contain the following information:

(1) A statement that an application for a site or facility permit, as applicable, has been filed and the type of sludge management activity regulated by Env-Ws 800 that is proposed;

(2) Identification of the proposed site or facility, as applicable, including street address and municipality;

(3) The names, addresses, and telephone numbers of:

a. The applicant;

b. The generators of the sludges that will be managed at the site or facility;

c. The operator at the site or facility; and

d. The owner, and the lessee, ***if the land is leased***;

(4) The estimated annual quantity of sludge, in ~~dry~~***wet*** tons, to be received at the site or facility;

~~(5) The sludge quality certification number(s) of the sludge(s), if applicable, that will be managed at the site or facility;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.01(d)(5), 804.03(a) Conflict | **Monadnock #26w E**, |
| 9-10/9-18-98 | rfp | 9-15-98 | gcb/pmc | | |

**Comment:** Here, it is implied that a Sludge Quality Certification is not required by a site or facility, by the words "if applicable" in the middle of the sentence. 804.03(a) states that an SQC is required for all manner of sludge business, except pass-through interstate transportation, in NH. The Department must clarify if a SQC is required for either the feedstock or the final product, or both.

**Response:** We have removed this requirement.

(~~6~~***5***) The proposed dates of commencement and cessation of the activity;

(~~7~~***6***) The identification of ~~a~~ ***the*** locally accessible place where the application, and all supporting information as required under Env-Ws 806.01 for site permits, and under Env-Ws 808.01 for facility permits, are available for review; and

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.01 Application Accessibility | **Legislative Services #23w**, **JLCAR #23w A**, |
| 8-24-98 | rfp | 9-15-98 | gcb | | |

**Comment:** If such a locally accessible place is intended as a requirement, such a requirement must be stated.

**Response:** We have revised Env-Ws 806.01 to include this requirement.

(~~8~~***7***) A statement that a public hearing will be held by the department once it has ~~received~~ ***deemed an*** ~~complete~~ application to be ***complete***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.01(d)(8) Public Hearing & Completed Application | BiogroAB I, |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** This section implies that the application must be complete prior to the scheduling of the public hearing. There may be additional information which becomes available during the public hearing and application review process. The intent of this section is that the applicant has submitted the required items and has the necessary information to enable the Department to begin processing the application. **Therefore, this section should be revised as follows:**

**Env-Ws 803.01 (8) A statement that a public hearing will be held by the department once it has accepted an application as complete for processing.**

**Response:** We have revised this section to clarify our intent.

(e) If a person to whom notice is required to be given ***cannot be located,*** fails or refuses to sign for the certified mail and/or refuses to sign an acknowledgment when the notice is delivered in hand, the person giving the notice shall ***provide proof to the department that an attempt to deliver the notice was made, which proof shall be in the form of an affidavit, or a copy of the certificate of mailing*** ~~so indicate in an affidavit~~ submitted to the department with the application.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.01(e) Notification | **BFI #56w Q**, |
| 10-55-98 | rfp | 10-17-98 | gcb | | |

**Comment:** If a person to whom notice is required to be given cannot be located, fails or refuses to sign for the certified mail and/or refuses to sign an acknowledgment when the notice is delivered in hand, the person giving the notice shall provide proof to the department that an attempt to deliver the notice was made, which proof may be in the form of any or all of the following: an affidavit, a copy of the certificate of mailing, or such other documentation as the person giving notice shall possess ~~so indicate in an affidavit submitted to the department with the application.~~

**General Comment: This does not account for all potential circumstances under which notice may be given.**

**Proposed Alternative: Allowance should also be made if the party cannot be located after reasonable efforts, and an affidavit should not be required in all instances.**

**Response:** We have revised this section to incorporate your suggested language.

Env-Ws 803.02 Notification Requirements for Land Applications.

(a) A person who will be land applying sludge shall provide notice in accordance with this section at least 14 days before the intended date of the first annual land application.

(b) The notice shall be published in a newspaper of general circulation in the municipality where the land application of sludge will occur and shall include the information required in Env-Ws 803.01(d)(2) ~~and~~ (3) ***and (5)***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.02 Notification | **Citizens #1w C,** |
| 9-15-98 | mwr | 11-5-98 | gcb | | |

**Comment:** Notification requirements are not adequate. Newspaper notices need to be larger and more legible. The terms SPF and biosolids should not be allowed. The terms "Class B Sewage Sludge" and Industrial "Sludge" should be required.
**Response:**.We believe the notification requirements are sufficient. The specifics of what type of sludge is proposed to be used can be discussed at the public hearing.

(c) A copy of the notice shall be posted continually at the entrances to the site beginning ***no later than*** 3 days prior to the application and ending ***no earlier than*** 3 days after application.

## PART Env-Ws 804 REQUIREMENTS FOR PERMITS

Env-Ws 804.01 Sludge Hauler Permits Required.

(a) Except as provided in (b) and (c) below, no person shall haul sludge ***derived from human waste which is not class A*** on public roads without first obtaining a sludge hauler permit from the department.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.01 Unnecessary Hauler Permits | **BIA #15w G,** |
| 9-8-98 | rfp | 10-23-98 | pmc | | |

**Comment:** Provisions to license each container used for hauling sludge are not necessary to protect public health and the environment.

**Response:** Redrafted the sludge hauler permit requirements.

(b) ~~Hauler permits~~ ***A sludge hauler*** permit shall not be required for the interstate transportation of ~~any~~ sludge which is not generated, processed, transferred, stored, used, or disposed of in New Hampshire.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.01 (b) Hauler Permits | **BFI #56w R,** |
| 10-15-98 | rfp | 10-27-98 | gcb | | |

**Comment:** (b) Hauler permits are required for all sludge deliveries to or from a site or facility regulated under Env-Ws 800 ~~shall not be required for the interstate transportation of any sludge which is not generated, processed, transferred, stored, used, or disposed of in New Hampshire.~~

**General Comment: The double negative makes this paragraph confusing and difficult to understand. These rules should only regulate the hauling of sludges which originate at or are destined for facilities and sites regulated under Env-Ws 800.**

**Response:** If you first read (a) above, this section seems to read better as a double negative.

(c) A ***sludge*** hauler permit shall not be required for ~~hauling~~***transporting*** sludge from a stockpile location at a permitted site to fields at the same site where the sludge is being land applied.

Env-Ws 804.02 Site and Facility Permits Required.

(a) ***Except as provided in Env-Ws 804.09, n***o person shall manage sludge at any place which does not have:

(1) A site or facility permit issued in accordance with Env-Ws 800;

(2) A wastewater treatment facility permit issued under RSA 485-A:13; or

(3) A solid waste facility permit issued under RSA 149-M.

(b) A site permit shall be required for:

(1) All sludge land application sites;

(2) All sludge mixing sites where the resultant sludge is to be used on site; ~~or~~ ***and***

(3) All sludge stockpile sites where sludge will be stockpiled for 8 months or less ~~in the event that~~ ***and where*** the stockpile location is not on a site permitted by (1) or (2) above.

(c) Except as provided in (d) below, a facility permit shall be required for:

(1) The processing, treatment, or disposal, ***other than land application***, of sludge;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.02(c) Facility Permits | **Biogro #44w J,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Section Env-Ws 802.08 "Disposal" defines land application activities as disposal. Therefore, both a site and facility permit are required for land application sites (whether agricultural, forestry or reclamation sites). In addition, this implies that a Env-Ws 800 facility permit is required at disposal locations such as landfills permitted under the Solid Waste Division to accept sludge or biosolids with other waste products. **Therefore, this section should be clarified as follows:**

**(c) Except as otherwise provided in these rules, a facility permit shall be required for:**
**(1) The processing, treatment or disposal, other than land application or beneficial use, of sludge;**

**Response:** We have revised this section to clarify our intent.

(2) All sludge mixing sites where the resultant sludge is to be used off-site;

(3) All sludge stockpile sites where sludge will be stockpiled for greater than 8 months;

(4) The construction, operation , and closure of sludge lagoons ***and monofills***; ~~or~~ ***and***

(5) The construction, operation, and closure of sludge transfer stations.

(d) A facility permit shall not be required for ~~pH adjustment~~ ***the processing*** of sludge for the ***sole*** purpose of odor control at a site permitted for land application.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.02(d) Facility Permits | **BFI #56w S**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (d) A facility permit shall not be required for sludge processing ~~pH adjustment of sludge~~ for the purpose of odor control at a site permitted for land application.

**General Comment: There are other forms of odor control, which should not require a facility permit (e.g., use of odor neutralizing and masking agents). (See also comment on 802.23)**

**Response:** We have revised this section to incorporate your comments.

Env-Ws 804.03 Sludge Quality Certification Required.

(a) Except as provided in (b) and (c) below, no person shall land apply, ***distribute for land application,*** sell, or give away any sludge~~,~~ ***or*** sludge mixture, ~~or a sludge-derived product~~ in bulk, from any generator that does not possess a valid sludge quality certification pursuant to Env-Ws 807.

~~(b) Sludge that is disposed of as a waste at a landfill permitted by the waste management division of the department shall not be required to obtain a sludge quality certification~~.

(e***b***) Facilities that provide additional treatment or processing of sludge~~(s)~~in addition to mixing, stockpile***ing***, storage***ing***, or transfer***ring*** from other sludge generating facilities shall ~~only be required~~

~~to~~ obtain a sludge quality certification for the final product ***if sludge from any contributing generator does not possess a sludge quality certification.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.03(c) Final SQC | **NHWPCA #29w E,** |
| 9-23-98 | rfp | 10-19-98<br>10-23-98 | gcb<br>pmc | | |

**Comment:** Clarify that if all of the incoming materials already have sludge quality certification, there is no need for an SQC on the final product. "mixing stockpile" should be replaced with "mixing, stockpiling, ... Processing or treatment of sludge is distinguished from mixing of sludge in this section. In the case of topsoil manufacturing, mixing of sludge is a processing from which a new product is derived. The rules should recognize that mixing is a form of sludge treatment.

**Response:** We have revised this section to clarify our intent.

(~~d~~*c*) A sludge quality certification shall not be required for ~~the interstate transportation of any~~ sludge which ~~was not generated, processed, transferred, stored, used, or disposed of in the state~~ ***is not used for land application.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.03 SQC Required | **BFI #56w T,** |
| 10-15-98 | rfp | 10-21-98 | gcb | | |

**Comment:** (a) Except as provided in (cb) and (de) below, no person shall land apply, sell, or give away any sludge[,] or sludge mixture~~, or a sludge-derived product, in bulk,~~ from any generator or facility that does not possess a valid sludge quality certification pursuant to Env-Ws 807.

(b) Except as provided in (c) and (d) below, no person shall land apply, sell, or give away any sludge-derived product unless:

(1) The sludge-derived product meets the metals requirements in Table 1 of 40 CFR 503.13; and

(2) If the sludge-derived product is derived from sludge containing pathogens, the sludge-derived product also meets the following requirements:

a. One of the following treatment methods specified in 40 CFR Part 503:

(1) 503.32(a)(1)-(8); or

(2) 503.32, Appendix B; and

b. One of the vector attraction reduction options specified in 40 CFR 503.33(b)(1) through 503.33(b)(8).

**General Comment: It is unclear between this paragraph and Env-Ws 801.02(d) if a SQC is required for sludge derived products meeting the exemption standards (503 pathogen/vector attraction reduction and the proposed NH metal standards). If a sludge mixture (i.e. BioMix™ Soil) meets the exemption standards it should then become a sludge-derived product which no longer requires a permit for use.**

(cb) Sludge and sludge derived products that are stockpiled or used as an engineered component of the cap, liner or cover system, including use as daily, intermediate or final cover, at a solid waste facility ~~is disposed of as a waste at a landfill~~ permitted by the waste management division of the department pursuant to RSA 149-M shall not be required to obtain a sludge quality certification.

**General Comment: BFI currently uses SPF® as an alternative daily cover in landfill operations. These rules should not require a SQC for SPF® going to a landfill for use as an alternative daily cover and, landfills should not be required to obtain a site permit under Env-Ws 800.**

(de) Facilities treating or processing sludge(s) or sludge-derived products which do not have a sludge quality certification shall ~~that provide additional treatment or processing of sludge(s) in addition to mixing[,] stockpil[ing],~~ storage, ~~or transfer from other sludge generating facilities shall only be required to~~ obtain a sludge quality certification for the final product resulting from the treatment or processing.

**General Comment: If a generator is delivering sludge to a BioMix™ Soil project, the generator should not be required to obtain a SQC on all of the SPF inputs; a SQC should only be required on the finished BioMix™ Soil.**

Env-Ws 804.04 Permit and Sludge Quality Certification Application Review.

(a) Within 30 days of receipt of an application with the appropriate fee for a site permit, a facility permit, a sludge quality certification , or a permit modification ***pursuant to Env-Ws 804.08(f)***, the department shall determine ~~whether~~***if*** the application is complete~~ and shall notify the applicant in writing~~.

***(b) Upon determination by the department that an application for a site, facility, sludge quality certification, or a permit modification pursuant to Env-Ws 804.08(f) is not complete, the department shall provide written notice to the applicant identifying the deficiencies causing the application to be deemed incomplete.***

(~~b~~***c***) Upon determination by the department that a site or facility application, or a permit modification application pursuant to Env-Ws 804.08(~~e~~***f***) is complete, the department shall:

(1) ~~Notify~~ ***Provide written notice of completeness to the applicant and*** the governing body of the municipality(ies) which received notice pursuant to Env-Ws 803.01(b)(1);

(2) Make ~~newspaper~~ notice of a public hearing ***and comment period*** for the pending permit application ***in a newspaper of local circulation***; ~~and~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.04 Hearing Notification | **Saffo B # o** |
| 8-27-98 | mwr | 9-15-98 | gcb | | |

**Comment:** Newspaper notices for public hearings on sites or facilities should be required to be put in a paper of local circulation. The notice should be large enough for people to see and read.

**Response:** We have revised this section to incorporate your comments.

(3) Schedule ***and hold*** the hearing no sooner than 30 days after the newspaper notice in (2) above in the municipality in which the activity is proposed to occur~~.~~***; and***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.04(b)(3) Schedule Hearing | **BFI #56w U,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (3) Schedule and hold the hearing within 15 to ~~no sooner than~~ 30 days after the newspaper notice in (2) above in the municipality in which the activity is proposed to occur.

**General Comment: The hearing date should also be specified, and be within a specified time frame.**

**Proposed Alternative: Hearing should be held within 15 to 30 days of the notice date.**

**Response:** We have revised this section to include the words "and hold".

***(4) Conduct the hearing in accordance with Env-C 203.***

(e*d*) The newspaper notice shall contain the following information:

(1) The name ***and mailing address*** of the applicant;

(2) The location ***,date, and the*** time of public hearing;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.04(c)(2) Hearing Notice | **BFI #56w V,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (2) The location, date and time of public hearing and any alternate arrangements in the event of inclement weather;

**General Comment: The notice should also specify the hearing date and alternate provisions in case of inclement weather.**

**Response:** We have revised this section to include the date.

(3) The ***locally accessible*** place where the application can be reviewed;

(4) The name, address, and telephone number of the person in the department receiving comments;

(5) The type of activity to be conducted;

(6) The proposed location of the site or facility;

(7) The name of the owner; and

(8) The deadline for submission of ~~public~~***written*** comments.

(~~d~~*e*) At the hearing:

(1) The applicant shall:

a. Make available 3 copies of the application, site plan, management plan, and, if ~~required by these rules~~ ***applicable***, the facility plan and the closure plan for the public to review;

b. Make a presentation to the public summarizing all the information required in the application, the site plan, the management plan and, if ~~required by these rules~~ ***applicable***, the facility plan***, the groundwater monitoring plan,*** and the closure plan; and

c. Respond to all questions concerning the proposed sludge management activity.

(2) After the applicant has responded to all questions concerning the proposed activity, the department shall:

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 803.01 Public Hearing Response | **Saffo # o C** |
| 8-27-98 | mwr | 9-16-98 | gcb | | |

**Comment:** DES should provide a written response to all comments received at the public hearing, including comments not directly related to the regulations.

**Response:** We make every effort to respond to all written comments received at the public hearing. However, since the purpose of the public hearing is to receive comments on the proposed activity, we believe our responses should be for questions concerning the proposed activity. Questions concerning DES policy or our rules should be handled apart from the public hearing

a. Receive public comments on the application and supporting information as to its accuracy ~~and completeness~~; ***and***

b. Receive all other public comments; ~~and~~

***(f)*** ~~e.~~ ***The department shall*** ~~A~~allow 15 days from the date of the hearing to receive written comments.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.04(d) At the Hearing | **BFI #56w W**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (d)

d. Provide an oral response to all questions concerning the proposed sludge management activity unless the applicant requests an opportunity to respond in writing to specific questions after the close of the hearing.

**General Comment: Does this refer to questions posed by the public at the hearing?**

**Proposed Alternative: Obligation to respond should be limited to oral responses which are provided to questions from the public at the time of the public hearing unless the applicant requests the opportunity to respond in writing to specific questions after the close of the hearing.**

(2) The department shall:

a. Moderate the hearing;

b. Determine which questions pertain to the permit application, and of those questions which the applicant must reasonably respond to.

**General Comment: The question period could get unruly and could result in questions that would not be considered reasonable or rational.**

**Proposed Alternative: DES should moderate the entire public hearing, and should determine which questions pertain to the permit application, and which questions the applicant may reasonably be expected to answer.**

(32) After the applicant has responded to all questions concerning the proposed activity, the department shall:

a. Receive public comments on the application and supporting information as to its accuracy ~~and completeness~~;

**General Comment: Only DES can make a determination of completeness.**

b. Receive all other public comments; and

c. Allow 15 days from the date of the hearing to receive written comments.

d. If requested in writing by the applicant, allow 45 days from the date of the hearing for the applicant to review and respond to written comments.

**General Comment: The applicant should be afforded an opportunity to review and respond to written comments if the applicant so requests.**

**Response:** Revised the section regarding the completeness issue.

(e*g*) Subject to (f*h*) below, within 120 days of receipt of a complete application, the department

shall issue or deny the site or facility permit, the sludge quality certification or the permit modification based on the criteria specified in Env-Ws 806.05, Env-Ws 808.05, Env-Ws 807.03, or Env-Ws 804.08, as applicable, and shall send written notice of its decision to the applicant and, in ***the*** case of a permit modification or a site or facility permit, to the governing body of the municipality(ies) to which the notice was sent pursuant to Env-Ws 803.01(b)(1).

(~~f~~***h***) The time spent waiting for the applicant to provide any requested information shall not be included when calculating the 120 days in (e***g***) above.

(~~g~~***i***) If the information submitted with any complete application is insufficient for the department to make a determination that the proposed activity will comply with the applicable requirements of RSA 485-A and these rules, the person proposing to undertake the activity shall provide such additional information as the department determines is necessary to make the determination. If the additional information is not submitted within 60 days of the department's request, the application shall be denied.

(~~h~~***j***) If ***site-specific*** conditions or limitations are necessary ~~to ensure that the proposed activity does not pose a threat~~ to **protect** public health or safety or the environment, the department shall include such conditions or limitations in the ***site or facility*** permit or ***sludge quality*** certification that is issued.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.04(h) Municipality Notice | **BFI #56w X**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (h) If site specific conditions or limitations are necessary to protect surface water or groundwater~~,ensure that the proposed activity does not pose a threat to public health or safety or the environment,~~ the department shall include such conditions or limitations in the site or facility permit ~~or certification that is~~ issued.

**General Comment: The phrase "necessary to ensure" is too broad and vague as to be capable of uniform enforcement. There is also confusion as to whether this applies to a permit application or SQC application.**

**Proposed Alternative: Specify the circumstances under which conditions or limitations may be imposed. To avoid confusion for the regulators and the regulated community, keep all operating conditions within the site specific permits.**

**Response:** We have revised the section to address your comments.

(~~i~~***k***) If a permit modification ***pursuant to Env-Ws 804.08(f)***, a site or a facility permit, or ***sludge quality*** certification is denied, the department shall ***notify the applicant and, in the case of a permit modification or a site or facility permit application, the municipality identified in Env-Ws 803.01(b) in writing noting the appropriate sections of the rules and stating*** ~~state~~ the specific reasons for the denial, and shall inform the applicant that the decision may be appealed to the water council ~~as established pursuant to~~***in accordance with*** RSA 21-O:7.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 804.04(I) Municipality Notice | **P. Adams #33w D,** |
|---|---|---|---|---|---|
| 10-12-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Add ...applicant ***and the municipality identified in Env-Ws 803.01(b). The applicant will be advised that...***
REASON: Municipality needs to be made aware of status of facility.

**Response:** We have revised this section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.04(I) Municipality Notice | **BFI #56w Y,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (I) If a permit modification, a site or a facility permit, or certification is denied, the department shall reference ~~state~~ the specific requirement the application failed to meet and the specific reason(s) for the denial~~;~~ [The department ~~and~~ shall also inform the applicant that the decision may be appealed to the water council as established pursuant to RSA 21-O:7.

**General Comment: A denial must be based on a failure to meet specific requirements of the rules.**

(j) [The governing body of the municipality in which the activity is proposed to occur may waive the hearing requirement by notifying the department within 2 weeks of the date of notification that it does not require a hearing]

**General Comment: Under the current regulations the local governing body can waive the need for a public hearing. This provision has been removed from the proposed regulations.**

**Proposed Alternative: The Department should maintain the hearing waiver provision in the new regulations. If the local governing body is comfortable with a project and is satisfied the abutters were notified, it should continue to retain the right to waive the hearing.**

**Response:** We have revised the section concerning 'denial' to address your concern. We have not revised the section concerning the waiver of the public hearing as we believe that a public hearing should always be held.

Env-Ws 804.05 Suspension, Revocation or Refusal to Renew.

(a) If after issuing a permit or ***a sludge quality*** certification the department receives information which indicates that good cause, as ~~defined~~ ***set forth*** in (f) ~~or~~ ***and*** (g) below, exists to suspend or revoke the permit or certification, the department shall proceed in accordance with ~~RSA 541-A:30~~ ***Env-C200***.

(b) After proceeding in accordance with ~~RSA 541-A:30~~ ***Env-C200***, the department shall revoke the permit or ***sludge quality*** certification if the department determines that the reason ***for***

~~that~~ good cause ~~exists~~ cannot be corrected to conform to applicable requirements.

(c) After proceeding in accordance with ~~RSA 541-A:30~~***Env-C200***, the department shall suspend the permit or ***sludge quality*** certification, subject to (d) below, if the department determines that, while good cause exists, the reason that good cause exists can be corrected to conform to applicable requirements.

(d) If a permit or ***sludge quality*** certification is suspended pursuant to (c) above, the department shall not reinstate the permit or certification until:

(1) The reason ***for*** ~~that~~ good cause ~~exists~~ has been corrected to conform with applicable requirements; and

(2) The permittee submits a written request to the department requesting that the permit or ***sludge quality*** certification be reinstated.

(e) If after receiving a request for renewal of a permit or ***sludge quality*** certification the department receives information which indicates that good cause, as ~~defined~~ ***set forth*** in (f) ~~or~~ ***and*** (g) below, exists to refuse to renew the permit or certification, the department shall proceed in accordance with ~~RSA 541-A:30~~***Env-C200*** and:

(1) Refuse to renew the permit or ***sludge quality*** certification, if the department determines that the reason that good cause exists cannot be corrected to conform to applicable requirements; or

(2) Renew the permit or ***sludge quality*** certification with a condition that the situation creating good cause be corrected to comply with applicable requirements.

~~(f) Good cause to suspend a permit or certification shall mean that emergency action is necessary to protect public health, safety, or welfare.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.05(f) Good Cause | **BFI #56w Z**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (f) Good cause to suspend a permit or certification shall mean that emergency action is necessary to protect public health, safety, or welfare. Good cause to suspend a permit or certification does not include actions to bring existing permits or certifications into compliance with the new regulatory standards ahead of the scheduled compliance dates specified in Env-Ws 806.02, 808.02, and 807.04.

**General Comment: This provision should not be interpreted to grant the Department authority to suspend or "call" any or all existing permits merely because the new rules may be more stringent and, therefore, arguably more protective of public health, safety or welfare.**

**Response:** We have removed this section as it is not needed.

(~~g~~*f*) Good cause to revoke or refuse to renew a permit or ***sludge quality*** certification shall include the following:

(1) The permit or ***sludge quality*** certificate holder has ~~failed to follow~~ ***not complied with*** the conditions of the~~ir~~ permit or these rules;

(2) The plans submitted with the application do not accurately portray the actual site, facility, or management activities;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.05(g)(1,2) Revoke or Refuse | **BFI #56w AA**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (g) Good cause to revoke or refuse to renew a permit or certification shall include the following:

(1) The permit or certificatione holder has not complied with ~~failed to follow~~ the conditions of their permit or these rules;

**General Comment: The phrase "failed to follow" is too vague as to be capable of uniform enforcement.**

(2) The plans submitted with the application do not accurately portray the actual site, facility, or management activities;

**General Comment: The Department should not expect or require surveyed plans.**

**Response:** We have revised the section to incorporate your comments.

(3) Any other information submitted in support of the application is not true and complete or is misleading;

(4) The permit or ***sludge quality*** certificate holder has failed to comply with an order of the department relative to sludge management , including an order to undertake corrective measures;

(5) The permit or ***sludge quality*** certificate holder has failed to comply with an order of the department relative to a violation of any other ~~law implemented~~***statute administered*** by the department; ***or***

~~(6) The permit or certificate holder has failed to submit an annual report in accordance with Env-Ws 806.12, Env-Ws 807.06, or Env-Ws 808.12; or~~

(~~7~~*6*) The permit or ***sludge quality*** certificate holder has failed to pay any ~~fees or~~ administrative, civil, or criminal penalties owed to the department.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 804.05 Appeals Process | **NHASH #54w F,** |
|---|---|---|---|---|---|
| 10-15-98 | rfp | | | | |

**Comment:** We would like to see the appeals process with the third party (perhaps the Water Council) spelled out as an option.

**Response:**

Env-Ws 804.06 Permit Transfer.

(a) A ***sludge*** hauler permit shall be issued to the applicant for the ~~container(s)~~ ***motorized units*** identified in the application and shall not be ~~sold, assigned, or otherwise~~ transferred by the permit holder to any other person ***unless prior approval is obtained from the department in accordance with (c) and (d) below.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.06(a) Permit Transfers | **Biogro #44w K,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Many municipalities utilize private management companies which own their own transport vehicles and containers. This provision would prohibit the transfer of permits by the company to another, even if the transfer is the result of a merger, or a simple name change of the parent company. It is expensive and unnecessary to require the issuance of new permits in these situations. It is important that the Department be notified of the transfer and be able to review company transfers. **Therefore, this section should be amended as follows:**

**(a) A hauler permit shall be issued to the applicant and shall not be sold, assigned or otherwise transferred by the permit holder to any other person(s) unless prior approval is obtained from the department in accordance with section ( c) below.**

**Response:** We have revised the section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.06(a) Permit Transfers | **BFI #56w AB,** |
| 10-15-98 | rfp | 10-19-98 | gcb | | |

**Comment:** (a) A hauler permit shall be issued to the applicant for the motorized unit(s) ~~container(s)~~ identified in the application and shall not be sold, assigned, or otherwise transferred by the permit holder to any other person unless prior approval is obtained from the department in accordance with (d) through (f) below.

**General Comment: A prohibition on the sale, assignment or transfer of a hauler permit would constitute an unnecessary impediment to commerce. By defining the terms "sold," "assigned" and "transferred," and by providing objective criteria for the review and approval of such transactions, the department can both protect public health and the environment and avoid unnecessary restrictions on the alienation of property rights.**

**Proposed Alternative: Define the terms "sold," "assigned" and "transferred," and provide objective criteria for review and approval of transactions involving permits and entities or individuals who hold permits.**

**Response:** We have revised the section to require a permit for the "motorized unit" and not each container.

~~(b) A facility permit shall be issued to the owner and shall not be sold, assigned, or otherwise transferred by the owner to any other person.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.06(b) Permit Transfer | **Biogro #44w L,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** As with the comment above, this section should be revised to enable permit transfers for facilities as follows:

**(b) A facility permit shall not be sold, assigned or otherwise transferred by the owner to any other person(s) unless prior approval is obtained from the department in accordance with section (c) below.**

**Response:** We have revised the section to enable permit transfers for facilities.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.06(b) Permit Transfers | **BFI #56w AC,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (b) A facility permit shall be issued to the applicant~~owner~~ and shall not be sold, assigned, or otherwise transferred by the applicant~~owner~~ to any other person unless prior approval is obtained from the department in accordance with (d) through (f) below.

**General Comment: Same as 804.06(a).**

**General Comment: As proposed, facility permits are issued only to the property owner. Because almost all site and facility permits occur on the same parcel of land and will be managed by the applicant, BFI Organics feels the Department should continue to issue site and facility permits to the party who will actually manage the site or facility (generally the applicant).**

**Response:** We have revised the section so that any person can now apply for a facility permit.

(e***b***) A site ***or facility*** permit shall be issued to the applicant and shall not be ~~sold, assigned or otherwise~~ transferred by the permit holder to any other person unless prior approval is obtained from the department in accordance with (~~d~~***c***) through (~~f~~***e***) below.

(~~d~~***c***) The person wishing to transfer a ~~site~~ permit shall submit ***to the department***:

(1) A copy of the original application;

(2) A copy of the permit;

(3) The name, address and telephone number of the person(s) to whom the permit will be transferred;

(4) A~~n~~ ***written*** explanation of any changes that are proposed to the permit, the site plan, ***the facility plan***, or the management plans, ***as applicable***; and

(5) A list of all changes that will require notification pursuant to Env-Ws 804.08(e).

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.06(d) Permit Transfers | **BFI #56w AD**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (d) The person wishing to transfer a ~~site~~ permit shall submit to the department:

**General Comment: Same as 804.06(a).**

**Proposed Alternative: Define permit transfer.**

(1) A copy of the original application;

(2) A copy of the permit;

(3) A page identifying t~~T~~he name, address and telephone number of the person(s) to whom the permit will be transferred;

(4) An written explanation of any changes that are proposed to the permit, the site plan, or the management plans, as applicable; and

**Response:** We have revised the section to incorporate most of your suggested language.

(e*d*) The person to whom the ~~site~~ permit is proposed to be transferred shall submit a statement declaring whether the person has been convicted of a misdemeanor under any statute ~~implemented~~ ***administered*** by the department within the 5 years prior to the date of application or of a felony ~~under any statute implemented by the department within~~ ***in any state or federal court within*** the 10 years prior to the date of application.

(~~f~~*e*) The department shall approve such transfer if:

(1) The permit holder is in compliance with these rules and the permit;

(2) ~~The~~ ***Any*** proposed changes are in compliance with these rules and the permit;

(3) Good cause as defined by Env-Ws 804.05***(f) and*** (g) to suspend, revoke, or refuse to renew the permit does not exist, unless the reason that good cause exists can be corrected prior to or as a result of the permit transfer; and

(4) The person to whom the permit is proposed to be transferred has not been convicted of a misdemeanor under any statute ~~implemented~~ ***administered*** by the department within the 5 years prior to the date of application, or of a felony ~~under any statute implemented by the department within~~ ***in any state or federal court within*** the 10 years prior to the date of application.

Env-Ws 804.07 Transfer of Land Ownership.

~~(a) For all facility permits and for those site permits where the permit holder is the owner, the permit shall become null and void upon transfer of ownership of the land upon which the site or facility is located.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.07(a) Permit Transfer | **Biogro #44w M,** |
| 10-5-98 | rfp | 10-30-98 | gcb | | |

**Comment:** As stated in the comments above, there is no need to completely nullify a facility or site permit because ownership has changed. Furthermore, a farm site could change ownership as part of their estate planning with no other changes to the actual operation of the site and under this provision require new permitting. It is important that the Department have a mechanism for reviewing the transfer **and therefore, this section should be revised as follows:**

**Env-Ws 804.07(a) Facility permits and site permits where the permit holder is the owner and the land ownership is transferred requires prior approval of the department in accordance with section ( c) below prior to transferring any site or facility permits.**

**Response:** We have removed this section as it is no longer needed.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.07(a) Permit Transfer | **BFI #56w AE,** |
| 10-15-98 | rfp | 10-30-98 | gcb | | |

**Comment:** (a) In the event of a transfer of land for which a site or facility permit has been issued, ~~For all facility permits and for those site permits where the permit holder is the owner,~~ the permit shall remain in full force and effect~~become null and void~~ upon transfer ~~of ownership~~ of the land upon which the site or facility is located, provided that:

(1) The new owner of the land is also to become the permit holder, and the permit has been transferred to the new owner of the land pursuant to Env-Ws 804.06; or

(2) If the new owner of the land is not also to become the permit holder, the new owner of the land provides a signed statement as described in (e) below.

**General Comment: Transfer of ownership of property should not automatically invalidate the existing permit(s), as acknowledged in 804.07(b). The term "transfer of ownership" is potentially ambiguous, and should be defined as conveyance of a fee simple interest.**

**Response:** We have removed this section as it is no longer needed.

~~(b) Prior to transfer of ownership of the land upon which a facility is located, the permit holder shall close the facility in accordance with Env-Ws 808.09 unless the new property owner provides a written statement notifying the department that the new owner assumes full responsibility for complying with these rules and the conditions specified in the existing permit~~.

(e***a***) In the event that the ~~permit~~ holder of a site ***or facility*** permit is not the owner of the land, the permit holder shall notify the department within 10 days of the transfer of the land on which the site~~;~~ ***or***

***facility,*** is located ~~is transferred~~ and shall suspend all activities covered by the permit at that property until the statement described in (e*c*) below is signed by the new property owner and is received by the department.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.07(c) Permit Transfer | **BFI #56w AF,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (c) In the event that the permit holder of a site or facility permit is not the owner of the land, and learns about a sale of the land for which the permit has been issued after the sale has occurred, the permit holder shall notify the department within 10 days of learning of the transfer of the land on which the site or facility, is located ~~is transferred~~ and shall suspend all activities covered by the permit at that property until the statement described in (e) below is signed by the new property owner and is received by the department.

**Response:** We have revised this section.

(~~d~~*b*) If a signed statement as described in (e**c**) below does not accompany the notice of ~~property~~ ***land*** transfer, then upon receipt of the notice the department shall commence a proceeding under ~~RSA 541-A:30~~***Env-C 200*** to revoke the permit. If the permit holder obtains and submits the signed statement the proceeding shall be terminated ~~and the permit holder may resume operations. If the permit holder does not obtain the signed statement, the proceeding shall continue and the department shall revoke the permit unless the permit holder can demonstrate that they have the right to continue to use the site.~~

(e*c*) The statement from the new ~~property~~ owner shall state that:

(1) The new owner is aware that the site ***or facility*** exists on the ~~property~~ ***land***;

(2) The new owner agrees to the continued operation of the site ***or facility***; and

(3) The new owner has given permission to the permit holder to enter upon the land for purposes of ~~site~~ investigation and operation ~~of the site~~, including the implementation of remedial measures if ordered by the department.

(~~f~~*d*) If the new owner chooses to discontinue the activities covered by the site ***or facility*** permit , the permit holder shall:

(1) Submit a written statement to the department indicating that the activities have been discontinued; ~~and~~

(2) Remove any infrastructure specific to the activities that were subject to the permit or registration~~.~~***; and***

***(3) If a facility, close the facility in accordance with the approved closure plan.***

Env-Ws 804.08 Modification for Site or Facility Permits.

(a) The department shall modify the ***conditions of*** a permit without request by the permittee***holder*** in order to achieve compliance with these rules. ~~Department modifications shall be made not less than 30 days after notice to the permittee stating the proposed modifications and reasons for the modifications~~ ***In the event of any such modification the department shall:***

***(1) Provide written notice to the permit holder stating the proposed modifications and the reason(s) for the modification(s);***

***(2) Provide the permit holder 30 days from the date of the written notice to comment in writing on the proposed permit modification(s);***

***(3) After considering the permit holder's written comments, if any, issue a revised permit with a timetable for bringing the permit holder's activities into compliance with the revised conditions of the permit; and***

***(4) Notify the permit holder that he/she may request an adjudicatory hearing in accordance with Env-C 200 if aggrieved by the department's decision.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.08(a) Applicant Input | **Biogro #44w N**, |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** The applicant should be provided with an opportunity to discuss Department mandated permit modifications. As written, this provision would enable the Department to make broad changes to a permit which could have a significant impact to the applicant (both economic and operationally). Furthermore, there may be other methods available to the permit holder to meet the objectives of the permit change which are not known to the Department. **Therefore, this section should be revised as follows:**

**(a) The Department shall modify the conditions of a permit without request by the permit holder in order to achieve compliance with these rules. Department modifications shall be made not less than 30 days after notice to the permit holder stating the proposed modification(s) and reasons for the modifications. The permit shall have a minimum of 20 days to provide the Department with alternative recommendations for the proposed permit modification to bring the permit in compliance with the rules.**

**Response:** We have revised this section to address your concerns.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.08(a) Applicant Input | **BFI #56w AG**, |
| 10-15-98 | rfp | 10-26-98 | gcb | | |

**Comment:** (a) For permits issued following the department's adoption of these rules, t~~T~~he department shall modify ~~such the~~ permits without request by the permittee in order to achieve compliance with these rules. ~~Department modifications shall be made not less than 30 days after notice to the permittee stating the proposed modifications and reasons for the modifications.~~ In the event of any such modification, the department shall:

(1) Provide written notice to the permittee stating the proposed modifications and reasons for the modifications;

(2) Provide the permittee 30 days from its receipt of the written notice described in 804.08(a)(1) above to respond in writing to the department's written notice;

(3) After considering the permittee's written comments, if any, issue a revised permit with a compliance timetable that shall allow the permittee a minimum of 90 days to bring its activities into compliance with the revised terms or conditions of its permit.

**General Comment: The meaning and purpose of this provision is unclear and ambiguous. The conditions of existing permits should be grandfathered. With respect to new permits, the department must describe and explain the reasons for any modifications, provide opportunity for comment, and a sufficient period of time to achieve compliance with any modified terms or conditions.**

**Response:** We have revised this section to incorporate your suggested language.

(b) The permit holder shall apply to the department for approval to modify a site or facility permit or to modify any ~~of the documentation previously submitted to the department under Env-Ws 800~~ ***permitted management activity*** prior to implementing any changes.

(c) The permit holder shall provide the following information ~~on a form obtained from~~ ***to*** the department:

(1) The site or facility permit number;

(2) The name, address, and telephone number of the permit holder, owner, operator, and generator;

(3) A detailed description of all proposed modifications~~, including:~~

***(4) A revised site, facility, management or closure plan highlighting the proposed changes;***

***(5)*** ~~a.~~ ***For a revised facility plan or closure plan*** ~~the complete plans and specifications of any structural modification stamped by~~, ***the stamp of*** a New Hampshire registered professional engineer;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.08(c)(3)a. Engineer Stamp | **Biogro #44w O**, |

| 10-5-98 | rfp | 10-19-98 | gcb | | |
|---|---|---|---|---|---|

**Comment:** Site permits for land application do not require engineering certification, therefore this section should not apply to site plans. To avoid confusion as to the intent of this section, the following language should be added.

**Response:** Revised section

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.08(c)(3)a. Engineer Stamp | **BFI #56w AH**, |
| 10-15-98 | rfp | 10-19-98 | gcb | | |

**Comment:** a. If required in the original plan, tThe complete plans and specifications of any structural modification stamped by a New Hampshire registered professional engineer;

**General Comment: A PE stamp should be required for a modification only if it was required for the original plan.**

**Response:** As it is quite possible that a modification could include plans or specs that weren't required in the original plan, we have not included your suggested language.

~~b. Any proposed changes in sludge management activities or closure plans~~;

*(6)* ~~c.~~ An explanation of why the proposed change*(s)* is necessary or desirable;

*(7)* ~~d.~~ The effect of the modification on the site*'s* or facility's~~;~~ capacity~~;~~ ***and*** life expectancy~~, and service area~~; and,

~~e. The effect of the modification on the environment, including any identifiable positive and/or adverse effects~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.08(c)(3)e. Modifications | **BFI #56w AI**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** e. ~~The~~ Reasonably identifiable positive and adverse effects of the modification on the groundwater or surface water at the site or facility~~; environment, including any identifiable positive and/or adverse effects.~~

**General Comment: The phrase "effect ... on the environment" is too general and vague to be capable of uniform enforcement. It should be narrowed to cover solely the media of concern, namely groundwater and surface water.**

**Response:** We have revised this section to address your comment.

*(8)* Identification and status of all other ***federal or state*** permits or approvals

necessary to effect the proposed modification(s);

(~~5~~*9*) The ~~applicant's~~ ***permit holder's*** proposed schedule for implementing such changes;

(~~6~~*10*) A list ~~of~~ and status of any outstanding violations, accompanied by a statement from the permit holder indicating how full compliance shall be attained prior to approval of the modification; and

(~~7~~*11*) A list of any ~~new~~ ***current*** abutters ~~affected by the modification~~ ***to whom the notice was not provided at the time of the original application.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 804.08(c)(7) New Abutters | **BFI #56w AJ,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (7) A list of any current ~~new~~ abutters as described in Env-Ws 803.01(b)(2), to whom notice was not provided pursuant to the requirements of Env-Ws 803.01 at the time of the original application. ~~affected by the modification.~~

**General Comment: The term "new" is ambiguous in this context.**

**Response:** Revised section to address your comment.

(d) The department shall approve the modification if it determines that:

(1) All applicable requirements of these rules have been met;

(2) If the applicant is other than the owner, the owner has given permission to the applicat~~ion~~***nt for the modification***;

(3) All other federal or state permits which are necessary for the proposed modification have been obtained ***applied for***;

(4) Management of the sludge at the site or facility ***is*** in accordance with the proposed modification ***and*** will not violate any statutes or rules ~~implemented~~ ***administered*** by the department; and

(5) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department.

(e) Subject to (f) below, applications to modify a permit shall be approved or denied within ~~30~~ ***90*** days of receipt of ~~a complete application~~ ***the information required in (c) above.***

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 804.08(e) Modification Approval or Denial | **BFI #56w AK**, |
|---|---|---|---|---|---|
| 10-15-98 | rfp | 10-27-98 | gcb | | |

**Comment:** (e) Subject to (f) below, applications to modify a permit undergo an initial completeness determination within 10 days of receipt of an application. Applications deemed complete shall be approved or denied within 20 days of the date on which they are determined by the department to be complete ~~be approved or denied within 30 days of receipt of a complete application.~~

**General Comment: The time period for DES to make a completeness determination should be specified.**

**Response:** Modifications that do not fall under (f) below do not require a completeness determination.

(f) If the proposed permit modification increases the quantity of sludge being managed at the site or facility by more than 20% from the quantity specified in the original permit application, ~~and is approved by the department, notification shall be provided pursuant to Env-Ws 803.0~~ ***the modification shall be processed in accordance with Env-Ws 803 and Env-Ws 804.04.***

***Env-Ws 804.09 Exemption for Land Application of Class A Sludge. Class A sludge from a generator with a valid Sludge Quality Certification under Env-Ws 807 shall be exempt from the requirement to obtain a site permit.***

**PART Env-Ws 805 SLUDGE HAULER PERMIT REQUIREMENTS**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805 General Hauler Comment | **BFI #56w AL**, |
| 10-15-98 | CIH | 10-26-98 | cih | | |

**Comment:** General Comment: The proposed system for regulating sludge transportation is overly and unnecessarily complex, and fails to follow the now standard regulatory approach for shipments of materials that may pose a risk to public health or the environment.

Proposed Alternative: If the Department feels it is necessary to regulate the transportation of sludge, the Department should adopt a manifest system whereby the Department will receive a legal document for each load of sludge removed from the waste water treatment facility, thereby avoiding the costly and time-consuming recordkeeping process currently proposed.

Proposed Language: [This concept has been incorporated into the various changes noted in Env-Ws Part 805.]

**Response:** Revised Part 805

Env-Ws 805.01 Sludge Hauler Permit Applications.

(a) Any applicant for a permit to remove or transport sludge ***derived from human waste which is not class A*** on public roads shall provide the following information on a form obtained from the department:

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01(a) Hauler Permit | **BFI #56w AM**, |
| 10-15-98 | CIH | 10-15-98 | cih | | |

**Comment:** General Comment: Trucks and containers should not require separate permits, and individual containers should not require any permits.

**Response:** The applicant will obtain and receive a hauler permit and although individual vehicles (motorized units) will not be individually permitted, they will be tracked by vehicle identification no. per Section Env-Ws 805.01 (a) (4). Individual containers will not be permitted.

(1) The name, address, ~~date of birth,~~ and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone numbers of the applicant's business and contact person;

(3) Any telephone numbers to be used in case of emergency;

(4) The vehicle identification numbers and license plate numbers for ***each motorized unit*** ~~the vehicles~~ which will be used to transport ~~the~~ containers ***carrying sludge***;

~~(5) The container identification number(s), if applicable;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01(a)(5) Container ID | **BFI #56w AN**, |
| 10-15-98 | CIH | 10-21-98 | cih | | |

**Comment:** [~~(5) The container identification number(s), if applicable;~~, #56/10-15-98cih]

**General Comment: Individual containers should not require identification numbers, permits or stickers.**

**Response:** Revised so that containers will not be tracked, there will be no identification numbers, and part (5) will be eliminated.

(56) The name, ***principal place of business*** ~~municipality~~, and telephone number of the sludge hauling company that will appear on both sides of the ~~vehicle~~ ***motorized unit***, which will be used to transport the container(s) ***carrying the sludge***, unless identified pursuant to Env-Ws 805.06(e***d***); ***and***

~~(7) The sludge quality certification number(s) of the sludge(s) proposed to be hauled;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01 (a) (7) SQC | **BFI #56w AO,** |
| 10-15-98 | CIH | 10-27-98 | cih | | |

**Comment: General Comment: This provision would take away the flexibility provided by Env-Ws 804.03(c). Final certification is needed under 805.01(a)(7) before sludge may be brought to the facility. How can it get there if it has to be certified before being transported? Moreover, this requirement would cause haulers to modify their permit applications each time they haul a new sludge.**

**Proposed Alternative: SQC numbers should not be required in an application for a sludge hauler permit.**

**Proposed Language: Delete Env-Ws 805.01 (a)(7);**

**Response:** Deleted Section Env-Ws 805.01 (a) (7), requirement for SQC numbers of sludges to be hauled.

~~(8) The location of each site, facility, or solid waste facility to which sludge is proposed to be taken; and,~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01(a)(8) Receival List | **Biogro #44w P,** |
| 10-5-98 | rfp | 10-21-98 | cih | | |

**Comment:** This section should be eliminated as it is not possible at the time of the permit application to identify all sites which may receive biosolids over the life of the permit for an on-going land application program. New sites are constantly added to biosolids land bases, while others may choose to withdraw from the program. Certain sites in a biosolids land base may or may not be used over the life of the hauling permit due to weather, cropping patterns and biosolids supply. Since sites are permitted independently, deliveries are already being tracked and regulated. **The listing of the service area in the hauler permit application is sufficient.**

**Response:** Deleted the requirement for listing site, facility, or solid waste facility to which sludge is proposed to be taken.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01(a)(8) Receival List | **BFI #56w AP,** |
| 10-15-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: The addition of new land application sites should not require a modification to the hauler permit. The department already requires the hauler to accompany the delivery with this information in 805.10 (a)(4).**
**Proposed Language: Delete Env-Ws 805.01 (a)(8);**

**Response:** Deleted Env-Ws 805.01 (a) (8).

(*96*) Whether the applicant or owner has been convicted of a misdemeanor under any statute ~~implemented~~ ***administered*** by the department within the 5 years prior to the date of application, or of a felony ~~under any statute implemented by the department within~~ ***in any state or federal court during the*** 10 years prior to the date of application.

(b) Each application shall be accompanied by the fee specified in Env-Ws 805.04.

~~(c) Each application shall be accompanied by a statement signed by the owner or authorized agent of each site, solid waste facility, or facility, to which the applicant proposes to haul, which acknowledges the applicant's intent to beneficially use or dispose of sludge at the site, facility, or solid waste facility, and authorizes such activity.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01(c) Overburdensome | **Biogro #44w Q**, |
| 10-5-98 | rfp | 10-21-98 | cih | | |

**Comment:** This requirement is unnecessary and overburdensome, especially for individual land application sites. As stated earlier, not all site locations that will be used in a land application program are known at the time of submittal of a hauler permit. Land application sites are constantly being added or deleted. Furthermore, a biosolids manager may be utilizing a designated disposal facility (landfill/incinerator) but may need to make a quick change (temporary or not) due to that facility being unable to continue to take the material (ex., an incinerator going off line for repairs or a landfill not having adequate bulking material or space capacity).

**As the Department already requires landowner consent as part of its site permit application process and annual reporting, this section should be revised as follows to provide the necessary reporting information by the hauler to the department:**

**( c) The hauler shall obtain general authorization for sludges to be delivered to a facility and provide a copy of such authorization to the department. The generator is responsible for providing the hauler with copies of all landowner consents when deliveries of sludge are made to individual sites for land application or beneficial use.**

**Response:** Removed this section.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01(c) Authorized Agent | **BFI #56w AQ**, |
| 10-15-98 | cih | cih | 10-21-98 | | |

**Comment:** General Comment: Is the "authorized agent" the "facility operator"? What is the definition of "authorized agent"? This information is already required in the site and facility permit application. This redundancy {See 806.01(c)(3) and 808.01(c)(4)) is not necessary for protection of human health and the environment and will unnecessarily increase application costs.

Proposed Language: Delete Env-Ws 805.01 (c).

**Response:** Removed this section.

(~~d~~c) Each application shall be accompanied by a certification that upon issuance of the permit, the applicant shall assume complete responsibility for ensuring that all persons who will be hauling sludge with the applicant's vehicle(s) are familiar with the requirements of these rules.

(e*d*) Each application shall be accompanied by a statement signed by the applicant stating that all vehicles proposed to be used to haul sludge have met all ~~necessary~~ ***applicable*** federal and state requirements ***for sludge transportation***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.01(d) Vehicles meet State & Fed. Req. | **BFI #56w AR,** |
| 10-15-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: "Necessary" is unclear. For purposes of hauling sludge? "Applicable" would make more sense.**

**Response:** "Applicable" to replace "necessary".

Env-Ws 805.02 Expiration of Sludge Hauler Permits. Sludge hauler permits issued after January 1, 199~~8~~*9*, shall have a duration of 2 years or less and shall expire on January 31 of the ~~even~~-***odd*** numbered year following the date of issuance.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.02 Expiration of Hauler Permits | **BFI #56w AS,** |
| 10-15-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: This provision is unclear and may be internally inconsistent.**

**Response:** All hauler permits shall run for a fixed period of time (i.e. Jan 1, 1999 to Jan. 31, 2001) and all hauler permits will expire at the end of that same fixed period. A new permit issued after the start of the two year interval will still expire at the end of the fixed two year interval and therefore its duration will be less than two years.

Env-Ws 805.03 Renewal of Sludge Hauler Permits. Any person to whom a sludge hauler permit has been issued, and who wishes to renew the permit, shall submit the information required in Env-Ws 805.01 and the ~~application~~ ***permit*** fee specified in Env-Ws 805.04 to the department not less than ~~15~~ ***30*** days prior to expiration of the permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.03 Renewal Duration | **BFI #56w AT,** |
| 10-15-98 | cih | 10-23-98 | pmc | | |

**Comment: General Comment: What happens if it takes the Department longer than 15 days to process the renewal application?**

**Proposed Alternative: If the renewal application is submitted timely (i.e., not less than 15 days prior to expiration of the permit), the permit remains in effect until a new permit is issued or the existing permit is denied.**

**Response:** We have revised the time from 15 days to 30 days.

Env-Ws 805.04 Sludge Hauler ~~Application~~ ***Permit*** Fee.

(a) A fee in the amount of $100 for each ~~container~~ ***motorized unit used to carry sludge*** shall accompany each application for issuance or renewal of a sludge hauler permit. ***If motorized units are replaced or added by the hauler, the hauler shall provide all required registration information to the department along with the additional fee for each motorized unit to be added.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.04(a) Application | **Biogro #44w R,** |
| 10-15-98 | cih | 10-21-98 | cih | | |

**Comment:** The motorized vehicle (road tractors and tank trucks) and its operator should be the primary subjects of the hauler permit. Fees should be associated only with each motorized vehicle. Furthermore, not all containers that may be used may be identified at the time of issuing hauler permits (ex., container rental due to regular trailer repairs). It is much more equitable and simpler to track motorized vehicles as is done by DOT and other similar regulatory programs. **Therefore, this section should be amended as follows:**

**(a) A fee in the amount of $100 for each vehicle to be used in New Hampshire shall accompany each application for issuance or renewal of a sludge hauler permit.**

**(1) In the event that vehicles are replaced or added by the hauler, the hauler shall provide all required registration information to the department along with the fee prorated for the remainder of the permit for each vehicle to be added.**

**Response:** Revised to require a $100 fee for each motorized unit and to include providing registration information for each motorized unit replaced or added motorized units after permit issuance.

~~(b) A fee in the amount of $5 shall accompany the application for each container needing a new or replacement sticker~~.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 805.04(b) Container Permit, Sticker and Fee | **BFI #56w AU,** |
|---|---|---|---|---|---|
| 10-15-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: Containers should not require permits, stickers or fees. What's the "sticker" for? Where are stickers defined or authorized? Is a replacement sticker the same as a renewal?**

**Proposed Language: Delete Env-Ws 805.04 (b).**

**Response:** Delete Env-Ws 805.04 (b).

(*b*e) The fee ~~shall be in the form of a~~ *, if paid by* check or money order, *shall be made* payable to "Treasurer-State of NH".

(~~d~~c) The fee shall not be prorated or refunded if the permit term established pursuant to Env-Ws 805.02 is less than a full 2 years.

(e*d*) Any municipality that hauls its own sludge shall be exempt from the fees specified above.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.04(e) Inequitable Fees 806.04(f) | **Monadnock #26w F,** |
| 9-10-98 | rfp | 9-14-98 | gcb | | |

**Comment:** Municipalities are exempt from the hauling fees specified in 805.04 (a) & (b). As noted in previous correspondence to the Department dated June 26, 1997, these sludge rules do not mandate that municipalities participate in the program, but rather provide another option for disposal of sludge, therefore, this issue should not be considered part of the "unfunded mandated" provision of Section 28-a. These rules must be made equitable, in that costs must be shared by all that participate within the program.

**Response:** The legislature has determined that any fees charged to a municipality are considered to be an unfunded mandate. Accordingly, we will continue to exempt municipalities from paying a fee.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.04(e) Fee Inequity | **Biogro #44w S,** |
| 10-5-98 | rfp | 10-21-98 | cih | | |

**Comment:** This item should be deleted. There is no difference in the amount of work required to process and administer municipal versus private haulers that would justify this exemption. Exempting municipalities discriminates against private enterprise and unfairly places the entire burden of financing the regulatory program on only one segment of the regulated community. Furthermore, while municipalities that operate their own land application programs would be exempt, municipalities that use private contractors will have to pay these fees, since the contractor will pass along the increased cost to the municipality.

By placing the entire burden of funding the hauler permit program upon the private haulers (who contract with municipalities as well as private industries) conflicts with the intent of the unfunded mandate legislation as it unfairly targets one segment of the regulated community (including those municipalities without the tax base and resources to undertake significant capital investments in purchasing and maintaining hauling equipment). **Exempting New Hampshire municipalities from the fees associated with the cost of managing the permit program is unfair, discriminatory and unconstitutional, and as such should be deleted.**

**Response:** See our response to comments from Monadnock F concerning the same subject.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.04(d)&(e) Inequitable Fees | **BFI #56w AV,** |
| 10-15-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: The proposed fee system is inequitable and confusing.**

**Proposed Language: Delete Env-Ws 805.04 (d) and 805.04 (e).**

**Response:**See our response to comments from Monadnock F concerning the same subject.

Env-Ws 805.05 Criteria for Review. The department shall issue or renew a sludge hauler permit, ***within 30 days of receipt of the information required in Env-Ws 805.01,*** for the ~~container~~ ***motorized unit(s)*** specified in the application, if it determines that the following criteria have been met:

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.05 Permit Motorized Unit | **BFI #56w AW,** |
| 10-15-98 | cih | 10-27-98 | cih | | |

**Comment: General Comment: Permit the motorized unit not the container, since a single container can be used for multiple generators.**

**Response:** Changed wording from "container" to "motorized unit".

(a) All applicable requirements of these rules have been met;

(b) ***The applicant submits a signed statement stating that a***~~All vehicles~~ ***motorized units,*** proposed to ***haul sludge comply with all applicable*** ~~be used to transport the container(s) have passed~~ , ~~all necessary~~ federal and state requirements ***required for sludge transportation;***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.05(b) "Necessary"Regs. | **BFI #56w AX**, |
| 10-15-98 | cih | 10-15-98 | cih | | |

**Comment: General Comment: "Necessary" is unclear. For purposes of hauling sludge? "Applicable" would make more sense.**

**Response:** Changed to read "The applicant submits a signed statement stating that all motorized units proposed to haul sludge comply with all applicable federal and state requirements."

~~(c) The site(s) or facility(ies) designated for receipt of the sludge are permitted to receive, handle, manage, store, use, or otherwise dispose of sludge;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.05(c) Manifest System | **BFI #56w AY**, |
| 10-15-98 | cih | 11-4-98 | gcb | | |

**Comment: General Comment: This information will be contained in the manifest system proposed by BFI Organics at 805.08(h). This provision is therefore unnecessarily redundant because it will not increase protection of human health or the environment.**

**Proposed Language: Delete Env-Ws 805.05 (c).**

**Response:** Item 805.05(c) has been deleted.

(~~d~~c) The applicant has not been convicted of a misdemeanor under any statute ~~implemented~~ ***administered*** by the department within the 5 years prior to the date of application, or of a felony ~~under any statute implemented by the department within~~ ***in any state or federal court during*** the 10 years prior to the date of application; and

(e***d***) The applicant has paid all fees and administrative, civil, or criminal penalties owed to the department.

Env-Ws 805.06 Vehicle Identification.

(a) A copy of the permit issued pursuant to Env-Ws 805 shall be retained in the vehicle(s) at all times.

(b) Each sludge hauler shall display the name, ~~municipality~~ ***principal place of business***, and telephone number of the hauler or hauling company on both sides of the ~~vehicle or container~~ ***motorized units***, used to transport sludge, unless exempt pursuant to (d) below.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 805.06 (b) Permit Motorized Unit | **BFI #56w AZ,** |
|---|---|---|---|---|---|
| 10-15-98 | cih | 10-21-98 | cih | | |

**Comment:** **General Comment: Permit the motorized unit not the container, since a single container can be used for multiple generators. The requirements for sludge transportation should apply equally to private and municipal entities.**

**Response:** Revised the section to permit the motorized unit.

(c) The information required by ***in*** (b) above shall be in permanent and legible lettering at least 3 inches high.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.06(b), (c) Vehicle Identification | **Monadnock #26w K,** |
| 9-10-98 | rfp | 9-14-98 | gcb | | |

**Comment:** Monadnock owns and maintains the containers used to transport our sludge. It is not appropriate to identify the hauler(s) with permanent lettering on our equipment. We are suggesting the use of magnetic signs, which may be removed easily, should the hauler change or the container need repainting.

**Response:** As previously worded, the hauler had the option putting the required information on either the vehicle or the container. As we believe that this information is usually on the hauling vehicle, we will remove the reference to the container.

~~(d) The department shall issue a sticker that shall be mounted on the curb side of the container.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.06 (d) Stickers | **BFI #56w BA,** |
| 10-16-98 | cih | 10-27-98 | gcb | | |

**Comment:** **General Comment: Stickers should not be required for individual containers.**

**Response:** Stickers will not be required for containers. Delete section (d).

(***de***) Municipal vehicles which bear the municipal seal on each side of the vehicle shall not need further identification.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.06(e) Municipal Seals | **BFI #56w BB,** |
| 10-16-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: The requirements for sludge transportation should apply equally to private and municipal entities. Municipal seals are frequently hard to read and are often indistinguishable at a distance.**

**Response:** Municipal seals are adequate for identifying the motorized unit.

***(e) Labeling of containers shall be required when hauling class B sludge. This labeling shall be legible, visible and mounted curbside in 3 inch tall lettering and shall read "class B sludge".***

Env-Ws 805.07 ~~Vehicle~~ Maintenance ***of Containers and Motorized Unit(s)***. Any hauler who has been issued a permit pursuant to Env-Ws 805 shall maintain all ~~vehicles~~ ***containers and motorized units*** used to haul ~~septage~~ ***sludge***, in accordance with the following:

(a) Each ~~vehicle~~ ***container and motorized unit*** shall be maintained so as not to create unreasonable malodors or public health hazards;

(b) Each container ***hauling sludge from which free water might be released during transport*** shall be watertight;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.07(b) Water Tight Containers | **Monadnock #26w G,** |
| 9-10-98 | rfp | 9-16-98 | gcb | | |

**Comment:** We suggest that the Department provide an exemption for those sludges which contain less than 60% water. Monadnock's sludge averages 50% water or less, the roll-off containers are stored inside and are covered during transport. It is not necessary that the containers be water-tight.

**Response:** We have revised this section to clarify our intent.

(c) All piping, valves, and rigid or flexible connections shall be accessible and capable of being cleaned;

(d) All inlet and outlet connections shall be constructed and maintained such that no material will leak, spill, or run out of the ~~tank~~ ***container*** during transfer or transportation; and

(e) Discharge outlets shall be designed to control the flow of discharge without spraying or flooding the receiving area.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.07(e) Discharge Outlet Requirement is not Applicable | **BFI #56w BC,** |
| 10-16-98 | cih | 10-21-98 | cih | | |

**Comment:** **General Comment: This requirement is vague and not applicable to sludge transportation.**

**Proposed Language: Delete Env-Ws 805.07 (e).**

**Response:** This is a health and safety issue and should be left in.

Env-Ws 805.08 Transportation of Sludge.

(a) Sludge, ***derived from human waste which is not class A,*** being transported to a land application or stockpile site shall meet Class B pathogen requirements as specified in 40 CFR Part 503.32 (b)(2), (b)(3), or (b)(4), and one of the vector attraction reduction requirements specified in 40 CFR Part 503.33 (b)(1) through (b)(10).

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(a) Pathogens | **Monadnock #26w H,** |
| 9-10-98 | rfp | 11-4-98 | gcb | | |

**Comment:** As noted for 802.27 above, industrial sludges, such as paper mill sludges, that do not contain pathogens (i.e. human waste) should not need to meet this criteria.

**Response:** We have revised this section to address your comment

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(a) Redundant to 805.08(b) | **BFI #56w BD,** |
| 10-16-98 | cih | 11-4-98 | gcb | | |

**Comment:** **General Comment: This section must contain a provision exempting sludge which does not contain any pathogens (i.e., SPF®) from further processing. This section is also redundant in light of 805.08(b).**

**Proposed Language: Delete Env Ws 805.08 (a)**

**Response:** We have revised this section to address your comment.

(b) All sludge shall ~~meet the~~ ***receive a*** sludge quality certification ~~requirements~~ in accordance with Env-Ws 807 prior to being transported to a site permitted under these rules.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(b) SQC status | **BioGro #41w A,** |
| 10-1-98 | rfp | 10-21-98 | cih | | |

**Comment:** The proposal indicates that all biosolids to be land applied would obtain a SQC.
Would biosolids going to Turnkey need an SQC for Category III/
Would biosolids going to an out of state facility need an SQC for a category III?
Would biosolids going to a compost facility other than their own (such as Nashua to Merrimack need an SQC?
I don't think that paying $1,000 for an SQC is necessary for going to a landfill or other disposal facility.

**Response:** This section refers to sludge going to sites permitted by these rules only.

(c) All containers used for hauling sludge shall be covered during transport to minimize odors.

(d) ~~All~~ Containers ~~used for~~ hauling sludge shall not be placed ~~overnight~~ ***for longer than 24 hours*** at a place that does not have a site or facility permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(d) Over Night Storage | **Monadnock #26w I**, |
| 9-10-98 | rfp | 9-16-98 | gcb | | |

**Comment:** Occasionally it is necessary for haulers to pull two loads from a single facility during one day (particularly if operational problems occur during production, and sludge must be removed quickly). In these cases, it is helpful if the hauler can stage a full container overnight at a secure location, close to the driver, so that the truck may be dispatched to the use site first thing in the morning as the site opens, in order that the second load may arrive before the site closes.

**Response:** Revised this section to allow for a container to be placed someplace other than the site or facility for a period of up to 24 hours.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(d) Container Storage | **NHWPCA #29w F**, |
| 9-23-98 | rfp | 10-21-98 | cih | | |

**Comment:** Up to 24 hour storage of sludge in containers should be allowed to enable frozen cans to be thawed in heated garages.

**Response:** Revised the section to allow for a container to be placed someplace other than the site or facility for a period of up to 24 hours.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(d) Container Storage | **BFI #56w BE**, |
| 10-16-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: Does this provision cover both empty and full containers? If so, all generators and transporters would need facility permits. Most wastewater treatment facilities operate 24 hours a day. Because the sludge may require removal before the facility or site is open to receive it, overnight parking of full or partially full containers is unavoidable.**

**Response:** We have revised the section to allow for a container to be placed someplace other than the site or facility for a period of up to 24 hours.

(e) All containers shall be inspected by the driver prior to transport on public roads to ensure that sludge will not leak, spill, or run out of the container during transfer or transportation;***and***

~~(f) All vehicles used to transport the containers shall be equipped at all times with spill control or absorbent materials and disinfectant materials, such as lime; and~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(f) Spill Control | **NHWPCA #29w G,** |
| 9-23-98 | rfp | 10-21-98 | cih | | |

**Comment:** This requirement is not practical. The cab of vehicles used to transport sludge is not equipped to carry or handle the materials listed here for spill control.

**Response:** We have removed this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(f) Spill Equipment | **Biogro #44w T,** |
| 10-5-98 | rfp | 10-21-98 | cih | | |

**Comment:** Vehicles should contain a spill remediation and notification plan. Trucks are not designed to hold additional materials in a sufficient quantity to completely remediate an accidental spill. What is important is that the driver have an accidental spill notification plan available complete with the emergency numbers so that appropriate personnel and equipment can be brought to the site. **Therefore, this section should be revised as follows:**

**(f) All vehicles used to transport containers shall be equipped with emergency numbers and a spill containment plan in accordance with Env-Ws 805.12 in the event that an accidental spill should occur.**

**Response:** We have removed this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08 Spill Material | **NHASH #54w G,** |
| 10-15-98 | rfp | 10-21-98 | cih | | |

**Comment:** Trucks have no available space to carry an indeterminate amount of spill control or absorbent materials and disinfectant materials, and a product like lime can not be carried on the exterior of the truck. It cannot be exposed to the elements.

**Response:** We have removed this requirement.

(g) All ~~vehicles~~ ***motorized units*** used to ~~transport the containers shall~~ ***haul sludge shall*** conform to all ***applicable*** federal and state requirements ***for sludge transportation***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.08(h) Recording of Sludge Delivery Info. | **BFI #56w BF**, |
| 10-16-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: Should be limited to applicable requirements.**

**General Comment: To include a manifest system a provision must be added for the recording of the sludge delivery information.**

**Response:** The information to be recorded as proposed in (h) above shall be included in Env-Ws 805.10, not in Env-Ws 805.08. See Env-Ws 805.10.

Env-Ws 805.09 Change of ~~Vehicles~~***Motorized Units***. Whenever a permit holder obtains an additional or replacement ~~vehicle~~ ***motorized unit***, for transporting the containers, the permit holder shall:

(a) Notify the department in writing ~~10 days~~ prior to ~~using the vehicle~~ ***placing the motorized unit in service*** to haul sludge;

(b) Supply the ~~vehicle~~ identification number and license plate number for the ~~vehicle(s)~~ ***motorized unit(s)***; and

(c) ~~Supply the permit number(s) for all containers that will be transported by the vehicle~~ ***Submit the additional fee, if required under Env-Ws 805.04***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.09(c) Changing Vehicles | **BFI #56w BG**, |
| 10-16-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: This provision is unduly burdensome and does not take into account the realities of business and the frequent need to change vehicles due to mechanical and other problems. In addition, individual containers should not require permit numbers, and it would be logistically and administratively impossible to identify the specific containers that would be hauled by a specific vehicle.**

**Response:** Env-Ws 805.09 (a) modified to reflect notification within 10 days of using the motorized unit. Delete (c) since containers will not be permitted.

Env-Ws 805.10 Recordkeeping.

~~(a) Each sludge hauler permit holder shall maintain the following information in the vehicle used to transport the container(s) whenever the vehicle is in transit to a site, facility, solid waste facility, or wastewater treatment facility:~~

***(a) Each sludge hauler permit holder shall record the following information, on a form provided by the department, for each load of sludge:***

***(1) The date the sludge is transported from the generator's site or facility;***

~~(1) The name, address, and telephone number of the generator;~~

***(2) The generator(s): name, address, and telephone number;***

~~(2) The name, address, and telephone number of the operator who should be contacted in case of an emergency;~~

~~(3) The sludge quality certification number, if applicable, and actual quantity of sludge, in tons, currently being transported; and~~

***(3) The quantity of sludge, in wet tons;***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.10(a)(3) Quantity Calculation | **NHWPCA #29w H,** |
| 9-23-98 | rfp | 11-4-98 | gcb | | |

**Comment:** The dry tonnage of material transported by sludge haulers is often calculated after performing solids analysis. There should be no requirement for the dry tonnage figure of sludge being transported to be maintained in the vehicle.
**Response:** Quantity to be in wet tons.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.10(a)(3) Quantity Calculation | **BFI #56w BH,** |
| 10-16-98 | cih | 10-21-98 | cih | | |

**Comment:** **General Comment: Calculation of dry tons at the time of pickup is not always practical since many wastewater treatment facilities have neither a laboratory nor the staff to perform the analysis and calculations to determine the dry tonnage.**

**Response:** Quantity to be in wet tons.

***(4) The type of sludge, such as domestic or industrial;***

***(5) The name, address, and telephone number of the hauler permit holder and driver of the motorized vehicle;***

(~~4~~6)The ***name, address, and telephone number of the*** site(s), facility(ies), solid waste facility(ies), or wastewater treatment facility to which the sludge is to be delivered~~.~~***; and***

***(7) The date delivered to the site or facility;***

~~(b) Every sludge hauler permit holder shall maintain the following records of each load of sludge:~~

~~(1) The date;~~

~~(2) The name and address of the generator(s) and its sludge quality certification number(s), if applicable;~~

~~(3) The quantity of sludge hauled, in dry tons; and~~

~~(4) The site, facility, solid waste facility, or wastewater treatment facility to which the load was delivered.~~

***(b) The information required in (a) above shall be maintained in the motorized unit used to transport the sludge when the sludge is being transported.***

(c) Records shall be maintained for a minimum of ~~3~~***5*** years after expiration of the hauler permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.10 Hauler Records | **Citizens #1w D,** |
| 8-19-98 | mwr | 9-16-98 | gcb | | |

**Comment:** Maintaining records for only three years is not long enough since most problems are likely to develop many years later. Our neighboring states require 5-6 years. Records should be kept longer.

**Response:** We will modify this section to require that records be maintained for a minimum of 5 years, which is consistent with the permit term for a site or facility permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.10 Hauler Records | **BFI #56w BI,** |
| 10-19-98 | cih | 10-19-98 | cih | | |

**Comment: General Comment: Because the hauler will retain a copy of the manifest, Section 805.10 (b) and (c) can be condensed into one section.**

**Response:** The Department will not require a specific manifest form to be retained, the information required for records will be as listed in Env-Ws 805.10(b) above.

Env-Ws 805.11 Reporting. Each hauler shall provide the information required by Env-Ws 805.10(b*a*); ~~by no later than the 15th of the month, for the previous~~ month*ly* to the operator of the site, facility, solid waste facility or wastewater treatment facility, to which the sludge is delivered ***by no later than the 15th of the following month***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.11 Reporting | **Monadnock #26w J,** |
| 9-10-98 | rfp | 9-16-98 | gcb | | |

**Comment:** This section requires the provision of records to facilities that are accepting sludges. Monadnock would expect that this provision only apply to in-state facilities as NH has no authority to regulate out of state facilities.

**Response:** We are not regulating out-of-state facilities. We are regulating sludge haulers.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 805.11 Reporting | **BFI #56w BJ,** |
| 10-19-98 | cih | 10-21-98 | cih | | |

**Comment: General Comment: A manifest system under which the information required in 805.10(a) is delivered to the site operator at the time of delivery makes this report unnecessary.**

**Response:** Since not all haulers use a manifest system, the wording shall remain as stated. If the manifest system covers the informational requirement then there would be no further action required to the delivery site.

Env-Ws 805.12 Accidental Release.

(a) In the event of an accidental release of sludge, the permit holder shall:

(a*1*) Immediately take action to contain the spill, minimize the environmental impact, and begin clean up procedures;

(~~b~~*2*) Subject to (e*b*) below, notify the department within 24 hours of the release with the following information:

~~(1)~~***a.*** The date, time and location of the spill;

~~(2)~~***b.*** The quantity of sludge spilled and the quantity of sludge recovered, in ~~dry~~ ***wet***;

~~(3)~~*c.* The quantity and final disposition of ~~the~~*any* sludge that was not recovered;

~~(4)~~*d.* The hauler's permit number and the name and telephone number of the driver involved in the incident;

~~(5)~~*e.* The name and telephone number of the generator;

~~(6)~~*f.* The approximate distance to any surface waters and storm drains ***within 100 feet of the spill***;

~~(7)~~*g.* The actions taken to control the extent of the spill ***and minimize the environmental impact***; and

~~(8)~~*h.* Future actions necessary to clean up the spill, if applicable.

(e*b*) Notification to the department shall not be required if all of the following conditions are met:

(1) The discharge is less than 25 gallons or 5 cubic feet if the sludge contains greater than 10 percent solids;

(2) The discharge is immediately contained;

(3) The discharge is completely removed within 24 hours; and

(4) There is no impact to groundwater or surface water.

**PART Env-Ws 806 SITE PERMIT REQUIREMENTS**

Env-Ws 806.01 Site Permit Applications.

(a) The person ~~who proposes~~ ***proposing*** to ~~manage~~ ***undertake*** the sludge ***management*** activities at the site shall apply for the site permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01 Site Permit Application | **BFI #56w BK**, |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (a) The person ~~who proposes~~proposing to ~~manage~~undertake the sludge management activities at the site shall ~~sludge activities at the site shall~~ apply for the site permit.

**General Comment: The phrase "sludge activities" is not defined.**

**Response:** We have revised this section to clarify our intent.

(b) The applicant shall provide the following information on a form obtained from the department:

(1) The name, address, ~~date of birth,~~ and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone number of the applicant's business;

(3) ***The name and telephone number of the person who can be reached 24 hours a day*** ~~Any telephone numbers to be used~~ in case of an emergency;

(4) The location of the proposed site, including street address, tax map and lot number, and current deed reference;

(5) The site owner's name, address, and telephone number;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(b)(5) Site Responsibility | **Biogro #44w U**, |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** In many cases, the site owner is not responsible for the management of the site. For example, many landowners lease their land to farmers who are responsible for the actual day to day operation of their site. Therefore, it is more important for the Department to have the contact information for the person actually responsible for the farm's management. **Therefore, this section should be revised as follows:**

**(b)(5) The site owner and farm operator's (if different) name, address and telephone number.**
**Response:**

(6) The name, mailing address, and ~~home~~ telephone numbers of each operator of the site, including each person's responsibility as it pertains to the regulated activities;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(b)(6) Manager | **Biogro #44w V**, |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** The land application activities for many land application sites are not managed by an individual, but rather a management company. In this instance, a home telephone number is not applicable. It is important for the Department to have an emergency telephone number on file, **therefore this section should be revised as follows:**

**(6) The name, mailing address and telephone numbers, including a 24-hour emergency number and contact person, of each land applier, including each person's responsibility as it pertains to the regulated activities;**

**Response:** We have revised this section to address your concerns.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(b)(6,7) Operator | **BFI #56w BL**, |

| 10-15-98 | rfp | 10-17-98 | gcb | | |
|---|---|---|---|---|---|

**Comment:** (6) The name, mailing address, and home telephone numbers of each operator, as defined in Env-Ws 802.17, of the site, including each person's responsibility as it pertains to the regulated activities;

**General Comment: How is "operator" defined for purposes of this provision? Does it include loader operators and truckers?**

(7) The type(s) of ~~sludge~~land application activity(ies) being proposed for the site, including, but not limited to, ~~such as~~ agricultural land application, forest application, reclamation, or stockpiling;

**General Comment: Site permits are solely for particular types of sludge management activities, namely land applications.**

**Response:** As operator is defined in Env-Ws 802, it is not necessary to repeat the reference. Relative to Env-Ws 806.01(b)(7), we have incorporated your suggested language.

(7) The type(s) of ~~sludge~~ ***land application*** activity(ies) being proposed for the site, ***including but not limited to*** ~~such as~~ agricultural land application, forest application, reclamation, or stockpiling;

(8) A description of the use of the site, including agricultural operations and crops grown on each field, if applicable, covering 5 years immediately prior to submission of the application; and

(9) Whether the applicant has been convicted of a misdemeanor under any statute ~~implemented~~ ***administered*** by the department within the 5 years prior to the date of application or of a felony ~~under any statute implemented by the department within~~ ***in any state or federal court during*** the 10 years prior to the date of application.

(c) The following shall be submitted with the application:

(1) The site plan prepared in accordance with Env-Ws 806.06, and a copy which has been reduced to a size of 8½ X 11 inches or 11 X 14 inches;

(2) The management plan prepared in accordance with Env-Ws 806.07;

***(3) If reclamation is proposed, the groundwater monitoring plan required in Env-Ws 809;***

(~~3~~***4***) A statement signed by the applicant certifying:

a. Compliance with the notification provisions of Env-Ws 803.01;

b. That all operators of the site ~~will have a copy~~ ***have been instructed on the requirements*** of Env-Ws 800 prior to working at the site;

c. That a copy of the application has been given to the governing body of the municipality in which the activity is proposed to occur; and

d. That the information submitted is accurate;

~~(4) A copy of the groundwater permit issued under RSA 485-A:13, if one has been issued, or a copy of the application if one is required but has not yet been issued;~~

(~~5~~4) A copy of the natural resource conservation service county soils survey map, or portion thereof, with the area(s) of proposed activity clearly delineated, including a description of each soil type found on the site;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(c)(5) Wetlands Location | **P. Adams #33w E,** |
| 10-12-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Add ...including a description ***and location*** of each soil type ***and any wetlands*** found on the site.
REASON: Must Identify where the soils are and any wetlands. Wetlands can exist where soil types are other than hydric and can appear since soil maps were prepared, e.g. generated because of beaver dams, road construction, etc.

**Response:** As this requirement is already in Env-Ws 806.06(o), it is not necessary to include it here.

(~~6~~5) ~~A~~***The*** description of ***the soil profile characteristics of*** each soil test pit~~'s~~ or auger boring~~'s soil profile characteristics, including depth to seasonal high water table, bedrock, or other restrictive layer~~ ***as required in Env-Ws 806.10(c)***;

(~~7~~6) An original of the most recent USGS map, ***largest scale available,*** with the latitude and longitude specified, showing the ***approximate*** location and boundaries of the site;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(c)(7) Map Scale | **P. Adams #33w F,** |
| 10-12-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Add ...recent USGS map, ***largest scale available, i.e. most detail***, with the latitude...
REASON: Provide maximum information and data available.

**Response:** We have revised this section to incorporate your suggested language.

(~~8~~7) The results of the soil analyses conducted in accordance with Env-Ws 806.10;

(~~9~~8) Written verification from the department of resources and economic development ~~that no~~ ***indicating whether or not a*** threatened or endangered species exist on the site~~;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(c)(9) Endangered or Threatened Species | **Biogro #44w W,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** This requirement implies a ban on biosolids applications if endangered or threatened species are present. This exceeds the intent of the EPA 503 regulations. The EPA requirement 503.14 (a) requires that biosolids "shall not be applied to the land if it is likely to adversely affect a threatened or endangered species...". **This section should therefore be revised as follows:**

**(c) (9) Written verification from the Department of Resources and Economic Development (DRED) indicating whether or not a threatened or endangered species exists on the site. If the site is a habitat for an endangered or threatened species, the applicant must obtain a written opinion from DRED that use of biosolids or sludge and the operation of land application equipment on the site in accordance with the site management will not adversely affect the threatened or endangered species.**

**Response:** We have modified this section to clarify our intent.

(~~10~~*9*) For all reclamation sites and forest application sites, a site-specific soil map or survey prepared in accordance with the Site-Specific Soil Mapping Standards for New Hampshire and Vermont, Society of Soil Scientists of Northern New England Publication No. 3, dated June 1997;

(~~11~~*10*) A list of all other state permits which are required for the proposed site and evidence that applications for those permits have been submitted; and

~~(12) A list of all local ordinances and by laws which are applicable to the proposed sludge management activity and a narrative description explaining the steps that will be taken to ensure compliance with them.;~~

***(11) The name and address of the locally accessible place where all information required in Env-Ws 806.01 can be reviewed.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(c) Application Information | **BFI #56w BM,** |
| 10-15-98 | rfp | 10-17-98 | gcb | | |

**Comment:** (c) The following shall be submitted with the application:

(1) The site plan prepared in accordance with Env-Ws 806.06, and a copy which has been reduced to a size of 8½ X 11 inches or 11 X 14 inches;

**General Comment: Tax map should be sufficient as a base map for the plan. See comments in 806.06.**

(2) The management plan prepared in accordance with Env-Ws 806.07;

(3) A statement signed by the applicant certifying:

a. Compliance with the notification provisions of Env-Ws 803.01;

b. That all operators, as defined in Env-Ws 802.17, of the site will have a copy of Env-Ws 800 prior to working at the site;

**General Comment: How is "operator" defined for purposes of this provision? Does it include loader operators and truckers?**

c. That a copy of the application has been given to the governing body of the municipality in which the activity is proposed to occur; and

d. That the information submitted is accurate;

(4) ~~A copy of the groundwater permit issued under RSA 485-A:13, if one has been issued, or a copy of the application if one is required but has not yet been issued;~~For any reclamation site at which more than 5000 wet tons of sludge will be land applied annually and there is a drinking water well within 500 feet of the site, a groundwater monitoring plan which shall include:

a) Monitoring well location(s) and rationale for location(s);

b) Description of monitoring well construction specifications;

c) Sampling frequency;

d) Parameters for analysis;

**General Comment: Groundwater permits should not be required for any land application activity where the sludge is applied at agronomic rates as determined by UNH Cooperative Extension.**

(5) A copy of the natural resource conservation service county soils survey map, or portion thereof, with the area(s) of proposed activity clearly delineated, including a description of each soil type found on the site;

(d) If the applicant is not the owner, the application shall be accompanied by a written statement ***in accordance with (e) below, and***~~;~~ signed by the owner~~;~~***;***

***(e) The written statement shall say*** that the owner is aware that the application is being filed and has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the sludge land application or stockpile site in the event that the department issues the permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01, Indemnification | Owen # o, |
| 8-26-98 | mwr | 9-16-98 | gcb | | |

**Comment:** Farmers that allow land application of sludge on their property should receive indemnification from the land applier or generator against any liability arising from the application of residuals.

**Response:** We require a statement in (g) below that ensures the generator is aware of his responsibility. Accordingly, we do not believe that your suggested language is necessary.

(e***f***)If the applicant is not the generator of the sludge(s), the application shall be accompanied by a written statement signed by each generator stating that the generator is ~~aware that they are~~ ultimately responsible for ensu***r***ing that the final disposition of the material is performed in accordance with these rules and 40 CFR ***p***art 503.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(e) Clarify Responsibility | NHWPCA #29w I, |
| 9-23-98 | rfp | 10-27-98 | gcb | | |

**Comment:** In order to clarify that the generator is ultimately responsible the middle portion of this sentence should read: (...statement signed by each generator stating that ***the generator*** is aware that the generator is ultimately responsible...). "ensuing" should be changed to "ensuring".

**Response:** We have revised this section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.01(e) Responsibility | **BFI #56 BN**, |
| 10-19-98 | rfp | 10-27-98 | gcb | | |

**Comment:** General Comment: What is the Department trying to accomplish with this requirement? This requirement is redundant since the generators are already ultimately responsible for the final disposition of their waste and the generator will receive delivery information under Env-Ws 805.11. What is the statutory basis for this requirement?

Proposed Language: Delete Env-Ws 806.01(e).

**Response:** We believe that it is important for the generator to continue to be aware that he is ultimately responsible for ensuring that his sludge is properly disposed.

(~~f~~***g***) Each application shall be:

(1) Signed by the applicant;

(2) Submitted in duplicate~~ if the site is adjacent to a river designated in accordance with RSA 483, New Hampshire rivers management and protection program~~; and

(3) Accompanied by the fee specified in Env-Ws 806.04.

Env-Ws 806.02 Expiration of Site Permits.

(a) ***Except as provided in (c) below, a*** site permit issued by the department shall expire 5 years from the date on which it was issued.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.02, 1 year permits | **Owen # o**, |
| 8-26-98 | mwr | 10-27-98 | gcb | | |

**Comment:** The permit term for land application sites should be one year.

**Response:** Given all the information that is required to be submitted by the applicant, plus the time it takes for a public hearing and for DES to process an application, we believe it is more practical to have permit terms of at least 5 years.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.02 Permit Duration | **NHASH #54w H**, |
| 10-15-98 | rfp | | | | |

**Comment:** We would like to see , like with the septage rules, the permits run unabated for the term of the permit.

**Response:**DES agrees that the permits run unabated for the term of the permit. However, the permit holder would be bound to comply with all applicable changes in the rules that occur while he has his permit.

(b) Any person land applying or stockpiling sludge at a site which previously did not require a

permit under Env-Ws 800 shall:

(1) Within ~~60~~***90*** days from the effective date of ~~these rules~~***the 1999 amendments to the Septage and Sludge Management Rules***, comply with all applicable provisions of Env-Ws 800 other than notification and permitting; and

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.02(b)(1) Compliance Timing | **NHWPCA #29w J**, |
| 9-23-98 | rfp | 10-17-98 | gcb | | |

**Comment:** With significant changes in these new rules, such as the limitations on stockpiling in wellhead protection areas, it will be impossible for everyone to comply with these rules within 60 days. It is recommended that the compliance period be extended to 180 days.

**Response:** We have revised the section to increase the time to 90 days.

(2) Within ~~90~~ ***120*** days of the effective date of ~~these rules~~***the 1999 amendments to the Septage and Sludge Management Rules***, ~~apply for a site permit~~ ***submit an updated site plan and management plan*** . ~~If a permit is denied, all sludge management activities shall cease and all stockpiles shall be removed from the site.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.02(f) Extend Compliance Time | **BFI # 56w BO**, |
| 10-19-98 | rfp | 10-26-98 | gcb | | |

**Comment:** **General Comment: Because the proposed rules require very detailed management plans, hydrogeologic studies, detailed site and soil characterizations and professionally designed and engineered structures, BFI Organics feels the time granted to bring existing, non-permitted facilities and sites into compliance with the proposed rules is inadequate.**

**Response:** We have revised the section to increase the time to 120 days.

***(c) A site permit issued by the department for land application of a sludge which is certified as a low metals sludge under Env-Ws 807.03 shall expire 10 years from the date on which it was issued.***

Env-Ws 806.03 Renewal of Site Permits. Any person to whom a site permit has been issued who wishes to renew the permit shall ***apply for a permit modification under Env-Ws 804.08(b) and*** submit the ~~information and application~~ ***permit*** fees required in ~~Env-Ws 806.01 and~~ Env-Ws 806.04~~, respectively,~~ to the department no later than 120 days prior to expiration of the permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.03 Notify Municipality | **P. Adams #33w G**, |
| 10-12-98 | rfp | 10-17-98 | gcb | | |

**Comment: Add** ...permit ***Municipalities, identified in Env-Ws 803(1)(b), will be advised when permits are renewed."***
REASON: Municipalities need to know when permits lapse or continue.

**Response:** As municipalities are automatically informed by the applicant when they re-apply for a permit, it is not necessary for DES to notify them.

Env-Ws 806.04 ~~Application~~ ***Permit*** ~~and Annual~~ Fees.

(a) A fee in the amount of $300 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with greater than 10 acres.

(b) A fee in the amount of $150 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with greater than 5 but less than or equal to 10 acres.

(c) A fee in the amount of $100 shall accompany each application for issuance or renewal of a site permit for land application or storage of sludge on sites with 5 or fewer acres.

~~(d) At the time the annual report is submitted, pursuant to Env-Ws 806.12, the permit holder shall pay an annual fee of $5 per dry ton of sludge that was received at a site provided that this fee has not been assessed to the same sludge on another under this section if the sludge was delivered to a site or facility~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.04(d) Clarify Fee Structure | **Monadnock #26w AD**, |
| 9-21-98 | rfp | 10-19-98 | gcb | | |

**Comment:** To clarify that the fee for the same sludge would not be assessed twice, This section should say: "At the time the annual report is submitted, pursuant to Env-Ws 806.12, the site permit holder shall pay $5 per dry ton of sludge that was delivered to a site from each generator. The fee shall not be assessed under this section if the sludge was delivered to a facility."

**Response:** Removed annual fee

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.04 Simplify Fee Structure | **NHWPCA #29w K**, |
| 9-23-98 | rfp | 10-19-98 | gcb | | |

**Comment:** Per ton fees for sludge, which are not exempt from the fees, should be required when the sludge leaves the wastewater treatment plant at which it is generated. No other fees should be assessed. This would eliminate the confusion of determining when a generator whose sludge may go to more than one facility or site should pay the per ton fee. With that said, municipalities are exempt from fees.

**Response:** We have removed the annual fee.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.04(d) Complicated Fee Structure | **BFI #56w BP**, |
| 10-19-98 | rfp | 10-19-98 | gcb | | |

**Comment:** (d) At the time the annual report is submitted, pursuant to Env-Ws 806.12, the permit holder shall pay, ~~[,]~~ ~~an~~a sludge management ~~annual~~ fee of ~~$5~~$1 per ~~dry~~wet ton of sludge delivered during the previous calendar year to a site or facility ~~that was received at a site~~ provided that this fee has not been assessed to the same sludge on another site or facility.

**General Comment: BFI Organics supports the assessment of a single, one-time fee per unit of sludge to be land applied, and opposes assessing any new or additional fee if sludge is moved between sites. Moreover, assessing the annual fee on a wet ton basis will encourage generators to optimize their dewatering operations.**

**Proposed Alternative: Because this is an annual fee, BFI Organics recommends the Department clarify that the annual fee will be assessed on the sludge only for the year in which it is produced.**

**Response:** We have removed the annual fee.

(~~e~~*d*) Fees ~~shall be in the form of a~~, ***if paid by*** check or money order, ***shall be made*** payable to "Treasurer-State of NH".

(~~f~~*e*) ~~Any New Hampshire municipality that land applies its own sludge or has its sludge~~***Sites where only sludge from New Hampshire municipalities is*** land applied shall be exempt from the fees specified in (a) through (~~d~~c) above.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.04(f) Discriminatory | **Biogro #44w X**, |
| 10-5-98 | rfp | 10-19-98 | gcb | | |

**Comment:** As stated earlier in Comment #19, it is unfair, discriminatory and unconstitutional to place the entire burden of funding the management of this program upon one segment of the regulated community. **Therefore, this section should be deleted.**
**Response:** Removed annual fee

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.04(f)Fee Structure | **NHASH #54w I,** |
| 10-15-98 | rfp | 10-19-98 | gcb | | |

**Comment:** The fees should be assessed to the generator, not the management company. As cited by NHWPCA, most treatment plants are municipally owned and operated and would then be exempt.
QUESTION: Are these fees being allocated to the department to fund the much needed enforcement application of these and the Env-Ws 1600 rules?

**Response:** We have removed the annual fee.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.04(f) Inequitable Fees | **BFI #56w BQ,** |
| 10-19-98 | rfp | 10-19-98 | gcb | | |

**Comment:** **General Comment: The proposed fee system is inequitable.**

**Proposed Language: Delete Env-Ws 806.04 (f)**

**Response:** We have removed the annual fee.

Env-Ws 806.05 Criteria for Review. The department shall issue or renew a site permit if it determines that:

(a) All applicable requirements of these rules have been met;

(b) If the applicant is other than the owner, the owner has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the site in the event that the department issues the permit;

(c) All other state permits which are necessary for the operation of the site have been ~~obtained or will be obtained and submitted to the department~~ ***applied for***;

(d) Management of sludge at the site in accordance with the application will not violate any statutes or rules implemented by the department;

(e) The permit holder has not been convicted of a misdemeanor under any statute ~~implemented~~ ***administered*** by the department within the 5 years prior to the date of application, or of a felony ~~under any statute implemented by the department within~~ ***in any state or federal court during*** the 10 years prior to the date of application; ~~and~~

(f) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department.~~;~~

(g) The permit holder has submitted all ~~required~~ test results and reports ***required for a site permit pursuant to Env-Ws 806.01;*** ***and***

***(h) The proposed use of sludge will not adversely affect the threatened or endangered species.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.05(g) Specific Results and Reports | **BFI #56w BR**, |
| 10-19-98 | rfp | 10-19-98 | gcb | | |

**Comment:** **General Comment: Should be restricted to all test results and reports required by the Department for the site permit under review.**

**Response:** We have revised the section to incorporate your suggested language.

Env-Ws 806.06 Site Plans. Site plans required under Env-Ws 806.01(c)(1) shall ~~show, the following~~ ***be based upon a municipal tax map, a surveyed plan, or other scaled drawing which identifies the proposed site location at a scale appropriate to delineate the information clearly and shall be marked to show***:

(a) A locus map which identifies the proposed site location at a scale appropriate to delineate the information clearly;

(b) The total land area, in acres, to be used for land application;

(c) The land area of each field, in acres, identified by unique field designation(s) and corresponding crop(s) proposed to be grown;

(d) The identification of access roads, access control measures, and buffer distances;

(e) The proposed stockpile or storage tank location(s);

(f) The identification of any easements or rights-of-way which exist on the property;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(f) Title Search? | **BFI #56w BS**, |
| 10-19-98 | rfp | 10-19-98 | gcb | | |

**Comment:** **General Comment: As proposed by the department, this would require a title search in the registry of deeds, thus imposing unnecessary added expense.**

**Response:** As most easements and rights-of-way have to be included in a person's deed, we do not believe it is necessary to perform a title search.

(g) The identification of proposed measures to control surface water runoff to or from the site

and stockpile locations, if applicable;

(h) The identification of surrounding land use, roads, ***and*** property lines~~, and significant features~~ within 500 feet of the site;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06 Surrounding land use | **Citizens #1w F**, |
| 8-20/9-25-98 | mwr/rfp | 9-16-98 | gcb | | |

**Comment:** The requirement to identify surrounding land use should be extended to 1000 ft. as in the present regulations as opposed to the 500 ft. requirement in the draft regulations. A school or public beach could be located within 510 feet of the sludge application site without DES being aware of his as they approve the permit.

**Response:** As the largest buffer distance is 500 feet, we believe that it is unnecessary for the applicant to identify land use, roads, and property lines beyond 500 feet. We should also point out that a site inspection is performed on all applications for a site or facility permit prior to issuance or denial of a permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(h) Significant Feature | **BFI #56w BT**, |
| 10-19-98 | rfp | 10-19-98 | gcb | | |

**Comment:** (~~hg~~) The identification of surrounding land use, roads, property lines, and significant features, as identified on the municipal tax map, within 500 feet of the site;

**General Comment: What is a "significant feature"? This provision also implies that a survey is required, which would add significant expense.**

**Proposed Alternative: Town tax map should be acceptable as a base map, and "significant feature" should be defined.**

**Response:** We have revised the section to remove the reference to significant features.

(I) All soil test pit and auger boring locations ~~shown as follows:~~;

~~(1) One soil test pit or auger boring for each soil mapping unit present on the natural resource conservation service county soils map, but no less than one every 5 acres; and~~

~~(2) One soil test pit or auger boring for each area proposed for stockpiling;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(I) NRCS is Sufficient | **NHWPCA #29w L**, |
| 9-23-98 | rfp | 10-19-98 | gcb | | |

**Comment:** The Natural Resource Conservation Service soil map is sufficient to provide guidance for agricultural use of organic residuals. There is no need to do soils investigations beyond the scope of the NRCS soil surveys when applying residuals to soil at agronomic rates.

**Response:** As the information on the NRCS soils map may be somewhat dated, we believe that it is appropriate to require additional testing.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(I) Soil Survey | **Biogro #44w Y**, |
| 10-5-98 | rfp | 10-19-98 | gcb | | |

**Comment:** This section implies that a soils investigation is required to verify the NRCS County Soil Survey at a level similar to an Order 1 Soils Survey. This is unnecessary and cost-prohibitive for agricultural applications. The NRCS County Soil Surveys are used successfully by farmers and their advisors to develop crop and fertilizer plans as well as soil conservation plans in addition to the management plans for biosolids use. There is no justification to require this level of additional soils investigation simply because biosolids are being used in the farm operation. It is appropriate to verify the depth to bedrock and depth to water table (at time of application) which can be done by auger boring by the applicant or site operator. **Therefore, this section should be revised as follows:**

**(I) All soil test pit or auger boring locations shown on the map to verify:**

**(1) Depth to bedrock;**
**(2) Depth to water table.**

**Guidance Note: Locations should be targeted to those areas of the site most likely to exhibit these characteristics such as soils with shallow depth to bedrock classifications and low lying areas of the site where the water table is most likely to be detected close to the surface.**

**Response:** As the information on the NRCS soils map can be somewhat dated, we believe it is appropriate to require the additional testing.

(j) The ***approximate*** location of and distance to all dwellings, structures, and water supply wells within 500 feet of the site;

(k) The names and addresses of all abutters;

(l) The name and location of all surface waters within 500 feet of the site, including their designated river classification ~~in accordance with~~ ***under*** RSA 483, New Hampshire rivers management and protection program, if applicable;

(m) The scale of the plan;

(n) An arrow indicating which direction on the plan is north;

(o) The location of all wetlands, within 250 feet of the ~~site~~ ***proposed land application area and within 500 feet of the proposed stockpile location(s)***, delineated on the basis of hydrophytic vegetation, hydric soils, and wetlands hydrology, in accordance with the techniques outlined in the "Corps of Engineer's Wetland Delineation Manual, Technical Report Y-87-1", January, 1987 ***and "Field Indicators for Identifying Hydric Soils in New England", Version 2, July, 1998; and***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(o) Excessive Information | **NHWPCA #29w M,** **NHASH #54w B,** |
| 9-23-98 | rfp | 10-19-98 | gcb | | |

**Comment:** *The location of all wetlands within 250 feet of the site delineated on the basis of hydrophobic vegetation, hydric soils, and wetlands hydrology, in accordance with the techniques outlined in the "Corps of Engineer's Wetland Delineation Manual, Technical Report Y-87-1", January 1987 [will be used as criteria for review of land spreading permit applications];*. Setbacks for land spreading are included in the regulations to protect both surface water and groundwater quality. With safeguards in place to identify appropriate spreading areas, there is no apparent reason for identifying wetlands outside of the boundaries of land application sites. With hydric soils being identified within the land application site area, and considering setbacks from property boundaries, there is no apparent reason for identifying all wetlands within 250 feet of the land application site. The costs to perform extensive wetland delineations outside of the land application site would be enormous.

**Response:** We have revised this section to clarify our intent.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(o) Wetlands Delineation | **White Mnt. RMI #49w P,** |
| 10-13-98 | rfp | 10-19-98 | gcb | | |

**Comment:** The proposed rules already require a 100-foot setback from property lines. With the requirement for identifying and not land applying on hydric soils on land application sites, there is certainly no demonstrable need to delineate wetlands that are not on the same parcel of property as the land application site. This requirement would be prohibitively expensive and appears to be a haphazardly insertion into the rules.

**Response:** We have revised this section to clarify our intent.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(o) Wetland's Designation | **Ken Kettenring #42w A,** |
| 10-5-98 | rfp | 10-19-98 | gcb | | |

**Comment:** Wetlands should be delineated in accordances with Wt 301.01(a) and (c), which requires the hydric soils component under the 87 manual to be in accordance with the *Field Indicators for Identifying Hydric Soils in New England.* (We have a rule change in progress to update the reference to version 2, July 1998- copy attached).

**Response:** We have revised this section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(o) Mapping | **Biogro #44w Z,** |
| 10-5-98 | rfp | 10-19-98 | gcb | | |

**Comment:** The word "delineated" implies that the applicant will have to engage a professional to map these areas. This level of detail and expense is unwarranted for the land application of biosolids as a fertilizer and soil conditioner. This standard is appropriate for investigation of a site that is proposed for intensive site development such as the construction of a subdivision or constructed facility. A wetlands delineation investigation is so burdensome that it is a disincentive to landowners from participating in the biosolids recycling program as it is not required nor recommended for developing agricultural field management plans for any other fertilizer, manure or soil conditioner. There is no technical basis for requiring this level of site investigation for an agricultural operation. It is more than sufficient for the applicant to identify these areas based on existing NRCS and USGS maps of the site. **Therefore, this section should be revised as follows:**

**(o) The location of all wetlands on the site as identified on NRCS Soil Surveys and USGS Quadrangle Maps;**

**Response:** We have revise this section to clarify our intent.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(o) Wetlands Location | **P. Adams #33w H,** |
| 10-12-98 | rfp | 10-19-98 | gcb | | |

**Comment:** Add ...all wetlands ***on the site and*** within 250 feet of the...
REASON: Wetlands can exist where soil types are other than hydric and can appear after soil maps were prepared, e.g. caused by beaver dams, road construction, etc. those close to the site boundaries require identification. Adding the word "boundaries" clarifies the fact that the site under discussion can cover considerable area.

**Response:** We have revised this section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(o) Impractical Delineation | **BFI #56w BU,** |
| 10-19-98 | rfp | 10-19-98 | gcb | | |

**Comment:** The location of all wetlands within 250 feet of the site using the municipal conservation commission's wetlands maps and the DES GIS database ~~delineated on the basis of hydrophytic vegetation, hydric soils, and wetlands hydrology, in accordance with the techniques outlined in the "Corps of Engineer's Wetland Delineation Manual, Technical Report Y-87-1", January, 1987;~~

**General Comment: BFI Organics feels this requirement is not practical for two reasons: 1) obtaining access to adjoining properties may not be possible; 2) the proposed setbacks already prohibit land application within 100 feet of the property boundary or 125 feet of surface water and; (3) the cost of wetlands delineation should not be imposed on applicants.**

**Proposed Alternative: Identification of wetlands should be based on and limited to a review of the municipality's conservation commission's wetlands maps and the DES GIS database.**

**Response:** We have revised this section to clarify our intent.

(p) The ***approximate*** location of all poorly ***and very poorly*** drained soils ***on the site***~~; and~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(p) Hydric Soils | **Ken Kettenring #42w B,** |
| 10-5-98 | rfp | 10-19-98 | gcb | | |

**Comment:** Location of all hydric soils rather than poorly drained.

**Response:** As hydric soils are already required in Env-Ws 806.06(o), we have not made your requested change.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(p) Very Poorly Drained Soil Location | **P. Adams #33w I,** |
| 10-12-98 | rfp | 10-19-98 | gcb | | |

**Comment:** Add "...the location of all ***very poorly drained and*** poorly drained soils."
REASON: Very poorly drained soil locations are as important, if not more important, than locations of poorly drained soils.

**Response:** We have revised this section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(p) Approximate | **BFI #56w BV,** |
| 10-19-98 | rfp | 10-19-98 | gcb | | |

**Comment:** (p̶o̶) The approximate location of all poorly drained soils using the data required under Env-Ws 806.01(c)(5) and 806.01(c)(6); and

**General Comment: Locations can only be approximate, since there is one test pit or soil boring per five acres.**

**Response:** We have revised this section to incorporate your suggested language.

(q) ~~The identification of proposed fields to be monitored annually for metals and justification for the choice~~ ***If reclamation is proposed, the items required in the groundwater monitoring plan specified in Env-Ws 809.03.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(q) Redundant Requirement | **NHWPCA #29w N, BFI #56w BW,** |
| 9-23-98 | rfp | 10-27-98 | gcb | | |

**Comment:** Based on the requirements in 806.10 (a), this requirement is unnecessary and should be deleted.

**Response:** As this requirement is redundant, we have deleted it.

Env-Ws 806.07 Management Plans. Each management plan required under Env-Ws 806.01(c)(2) shall include the following:

(a) The normal hours of operation of the site;

(b) Proposed route(s) of access to the site;

(c) The method of application, if land applying;

(d) Stockpiling management provisions, if applicable;

(e) The name of the generator***(s)*** and its corresponding sludge quality certification number***(s)*** for any sludge which will be received at the site;

(f) The quantity of sludge, in ~~dry~~***wet*** tons, expected on a periodic basis, such as daily, weekly or monthly, and the estimated annual tonnage;

(g) The quantity of sludge, in ~~dry~~***wet*** tons, expected over the entire life expectancy of the site ;

(h) A description of all sludge mixing activities which are proposed for the site;

~~(I) For sludge which contains pathogens the proposed measures to meet the pathogen reduction and vector attraction reduction requirements as specified in 40 CFR 503;~~

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 806.07(I) Pathogens | **Clean Water #55w E,** |
|---|---|---|---|---|---|
| 10-15-98 | rfp | | | | |

**Comment:** We continue to have concerns over the ability of current or proposed administrative rules to control the spread of human pathogens from sludge to air, groundwater, or surface water. Dr. Aaron Margolin at UNH and others in the field documents that dangerous viruses can travel long distances under ground (at least 6 feet, vertically) and survive for long periods, especially in cold climates such as ours. Other research conducted in Kansas City Missouri found large soil concentrations of Salmonella and E. coli bacteria surviving up to a year after sludge application. Dr,. David Lewis of the EPA National Exposure Research Laboratory argues that the health risk of these pathogens to immuno-compromised individuals call for reducing exposure levels by at least one or two orders of magnitude below those calculated in normal risk assessments, such as used in the federal part 503 regulations.

It would be only prudent to make further restrictions or outright bans on Class B sludge applications where this potential is higher. Such situations include applications over aquifers (gravel pit reclamations and well recharge areas), within watersheds of Class A/ surface drinking water sources, and flood plains of significant rivers. Additionally, serious consideration should be given to extending the waiting period after application in dairy pastures and food crop fields.

**Response:**

~~(j) For sludge which contains pathogens, the additional on-site measures to be taken to control vectors;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(I), (j) | **Monadnock #26w L,** |
| 9-10-98 | rfp | 9-16-98 | gcb | | |

**Comment:** These citations provide an exemption for listing the measures to meet pathogen and vector attraction requirements of 40 CFR 503 and additional on-site measures to control vectors for sludges which do not contain pathogens. Though DES recognized that pathogen and vector attraction reduction need not be implemented on sludges which do not contain pathogens, and provide an exemption within the management plan portion of the rule, there is no provision to exempt pathogen-free industrial sludges from Ws 800, even though they may meet the same exclusion criteria as municipal sludges in 801.02(d).

**Response:** Revised the section

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(j) Additional Odor Control | **Biogro #44w AA,** |
| 10-5-98 | rfp | 10-19-98 | gcb | | |

**Comment:** This section is vague and confusing as written. Additional odor control measures which may be used on a site beyond meeting the pathogen and vector attraction requirements for Class B biosolids are required by developing a site specific odor management plan outlined in Env-Ws 806.07(l). **As this section is vague and duplicates the more detailed requirement of the odor management plan, this section should be deleted.**

**Response:** As this section is redundant, we have deleted it.

(~~k~~*i*) ***A description of the*** record keeping procedures;

(~~l~~*j*) A detailed odor control plan explaining:

(1) The procedures that ~~will~~ ***shall*** be used to address and resolve any odor complaints;

(2) The name, address, and telephone number of the person(s) who ~~will~~ ***shall*** be responsible for responding to odor complaints; and

(3) ~~Additional~~ ***S***ite management techniques that ~~will~~ ***shall*** be employed to minimize odors ~~such as increased setbacks and not spreading on holidays or weekends~~;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(l) Odor Control | **BFI #40w A,** **BioGro #41w B,** |
| 10-1-98 | rfp | 11-4-98 | gcb | | |

**Comment:** The performance Standard for odor would be highly subjective due to the inability to realistically measure odor quantitatively at a beneficial use site. BioGro is concerned about creating SQC categories based upon aesthetic quantities or characteristics. Unfortunately, aesthetic quantity determinations are very difficult to quantify as this is highly subjective. I would like to recommend sticking with the 503's and the vector attraction process. Going beyond what I think will be a regulatory nightmare.

**Response:** We do not have a performance standard for odor control other than minimizing it as much as possible.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(l)(3) Increase Setbacks | **BioGro #44w AB,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** This language implies that increased setbacks may be mandated by DES as part of issuing the site permit. Increasing setbacks may be one of several methods used in an odor control plan to minimize the impact of land application spreading operations on the landowner and abutting properties. As the odor control plan should reflect the aesthetics of the material being spread and should be site specific, the references to timing of the application or increasing setbacks should not referenced as the only methods that can be used. **Therefore, this section should be revised as follows:**

**(3) Additional site management techniques that will be employed to minimize odors;**

**Response:** We have revised the section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07 Odor Control | **Mass WRA #46w D**, |
| 10-7-98 | rfp | 10-21-98 | gcb | | |

**Comment:** One area in which the proposed regulations should help to improve the practice of land application in New Hampshire is the attention to odor control; we support this effort.

**Response:** No response necessary.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(l)(3) Community Concerns | **P. Adams #33w J**, |
| 10-13-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Add: "..to minimize odors ***and satisfy community concerns*** such as increase..."
REASON: Important to realize that site management techniques must address community concerns.

**Response:** We have added your suggested language to this section.

(~~m~~*k*) ~~If any sludge, or any mixture thereof, is being land applied,~~ *A* nutrient management plan, for the final ***sludge*** mixture to be land applied for each field, specific for each crop or vegetation type, containing the following information:

(1) The crops or vegetation to be grown;

(2) A copy of UNH cooperative extension's nutrient management recommendations;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(m)(2) UNH Authority | **BioGro #44w AC**, |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Farmers utilize the services of numerous agricultural advisors including, but not limited to, UNH Cooperative Extension agents, NRCS (especially in the development of manure management facilities and soil conservation plans) and certified crop advisors or other agricultural advisors to develop their nutrient management plans to determine their off-farm fertilizer and soil conditioning needs. UNH Cooperative Extension does not have the sole authority to develop guidelines for nutrient management planning for individual sites using biosolids. This requirement exceeds the advisory consultant role of UNH Cooperative Extension as it implies that UNH Cooperative Extension must review and approve farm or on-site nutrient management plans for each site that uses biosolids. Furthermore, the Department lacks the statutory authority to make such a delegation. **Therefore, this section should be revised as follows:**

**(2) A copy of the farm or site nutrient management plan developed in accordance with guidelines of UNH Cooperative Extension, USDA, NH Department of Agriculture, NRCS or other qualified agricultural or crop advisor(s).**

**Response:** For consistency purposes, we believe that it is appropriate to have only one source to develop nutrient management plans.

(3) The ~~application~~***agronomic*** rate calculations for land application of sludge on agricultural lands, performed in accordance with the "Best Management Practices : Biosolids" published by the UNH cooperative extension, and based on the ***nutrient content of the*** sludge or sludge mixture that is proposed to be land applied;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07 Agronomic Rate | **Citizens #1w G, Shields # o D,** |
| 8-20 / 9-25-98 | mwr/rfp | 9-15-98 | gcb | | |

**Comment:** The term agronomic has been removed to allow outrageously high loading rates at reclamations sites. In addition, pH management should be required and the application of anaerobically digested sludge should be prohibited.

**Response:** Application rate calculations will still be based on the nutrient management recommendations from UNH Cooperative Extension Service. However, to avoid any confusion, we will put the word "agronomic" back in.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07 Prohibit Reclamation | **N.H.Sierra Club #38w C,** |
| 9-28-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Prohibit the reclamation of gravel pits with sludge.

**Response:** We have revised the regulations to only allow Category I sludge on reclamation sites.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 806.07 Phosphorus management | **Hartman # o, Hodsdon # o** |
|---|---|---|---|---|---|
| 8-27-98 | mwr | 9-15-98 | gcb | | |

**Comment:** Because of the sensitivity of surface waters to phosphorus, DES should require phosphorus management. Phosphorus applications above agronomic rates should be scrutinized.

**Response:** The Department believes that the setbacks in these rules will protect surfacewaters from phosphorus discharges.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(m)(3) Agricultural Advisors | **Biogro #44w AD,** |
| 10-5-98 | rfp | 10-17-98 | gcb | | |

**Comment:** Fertilizer recommendations for crops have been developed by a wide variety of agricultural advisors. These recommendations should continue to apply regardless of the fertilizer chosen by the landowner. Biosolids, like animal manures, are slow release sources of nitrogen and as such require an agronomic calculation using a mineralization rate. Actual mineralization rates have been found to differ between biosolids sources. The current BMP document includes a mineralization rate which is very conservative and based on on-going research. While this conservative rate may be very protective, it may in fact not be accurate for all of the biosolids being land applied in New Hampshire. **Generators should have the option of undertaking mineralization studies of their biosolids to determine the actual rate of mineralization for their biosolids.**

**Therefore, this section should be revised as follows:**

**(3) The application rate calculations for land application of sludge on agricultural lands, performed in accordance with the "Best Management Practices Guidelines for Biosolids", published by UNH Cooperative Extension, and based on the sludge or sludge mixture that is to be land applied, unless sludge or sludge mixture specific information, obtained by studies or research conducted by a qualified professional and/or fertilizer recommendations based upon documented yield results and realistic yield goals for the site is available.**

**Response:** For consistency purposes, we believe it is appropriate to use only one source when developing application rates.

(4) The ~~application~~***agronomic*** rate calculations for land application of sludge on forested land ***or for*** reclamation~~, or for topsoil manufacturing, as applicable~~, performed in consultation with UNH cooperative extension;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07 Concern about reclamations and forest applications | **Citizens #1w J, Johnson # o,** |
| 8-26 / 9-25-98 | mwr/rfp | 10-19-98 | gcb | | |

**Comment:** Forests and gravel pits are not acceptable sites for land application of sewage sludge or industrial sludge. Gravel pits are of particular concern since typically the soils are highly permeable and groundwater tends to be high. Coupled with the high loading rates used to re-establish a topsoil and a lack of basic research on fate and transport of nitrogen and other potential sludge contaminants, the use of wastewater residuals for gravel pit restoration represents unacceptable risk to groundwater and potentially human health.

Forest applications especially after clear cuts are detrimental. Such sites already have an excess of nitrogen available for leaching to the groundwater or to run-off into surface waters. Again, research gaps relative to environmental and wildlife impacts add to the certainty of using these materials on forest lands. This combination of uncertainty and known adverse affects makes forest applications inadvisable.

**Response:** We believe that, when properly managed, forests and gravel pits are acceptable sites for land application of sludge.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07 Prohibit Forest Application | **N.H. Sierra Club #38w F,** |
| 9-28-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Prohibit using sludges in forests. Especially in clear-cut areas due to high potential for runoff and exposure to wildlife.

**Response:** See our response to comments from Citizens concerning the same subject.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(m)(2-4) UNH Regulating? | **NHWPCA #29w O, NHASH #54w J,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** UNH Cooperative Extension does not formally have the charge to regulate the use of organic residuals. Their input is valuable, but should not be used as a basis for regulation. Recommendations from Cooperative Extension can be subjective and are sometimes based on a cost/benefit analysis that is not applicable to the use of organic residuals that are often free of charge to farmers. While the NHWPCA supports a continued role for Cooperative Extension in the offering expertise on agronomic issues, we believe that this role should be advisory, not regulatory. Also, how will Coop. Extension take on all of this additional work with no funding for additional staff?

**Response:** Since DES determines whether or not to accept the UNH Cooperative Extension's recommendations, we believe that their role is, in fact, advisory.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07 Reduce Application Rates | **N.H.Sierra Club #38w K,** |
| 9-28-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Application rates need to be lower.

**Response:** We believe that our proposed application rates are adequate to grow a crop while ensuring that public health, safety and the environment are protected.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(m)(4) Rate Determination | **Biogro #44w AE,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The language as written is vague and open to misunderstanding and misinterpretation, which may lead to arbitrary determinations of application rates from site to site. Specific published rates and standards need to be developed in accordance with the New Hampshire Rule Making Manual for reclamation and forestry applications as well as for topsoil manufacturing. The UNH Cooperative Extension is not the primary resource for managers of forestry or reclamation sites as these professionals rely upon the expertise of foresters and other regulatory agencies such as the Forest Service, NRCS and Soil Conservation Districts for guidance in developing their site management plans.

Bio Gro strongly suggests that standardized application rates and calculations be developed for various types of application sites. It is important that all applications be judged by a clearly defined and uniformly applied set of standards which are developed in an open and peer-reviewed process to ensure that the best available information of our area's leading advisors in these fields is included. **Therefore, we recommend this section be revised as follows:**

**(m)(3) The application rate calculations for land application of sludge on forested land, reclamation or for topsoil manufacturing, as applicable, and the documentation relied upon to develop these rates. The department encourages applicants to consult with the appropriate advisors which can include but not be limited to, UNH Cooperative Extension, NRCS, Soil Conservation Districts and the Forest Service.**

As a clarification, reclamations rates and topsoil manufacturing should be referred to as "above agronomic rates" (as per the 503's) since the purpose is to supply sufficient organic matter and nutrients to establish and sustain vegetative cover for several years on a site until topsoil and a self-sustaining permanent vegetative stand are well-established. Forest land, like crop land, would receive biosolids at an agronomic fertilizer rate.

**Response:** DES will continue to use UNH Cooperative Extension's recommendations for agronomic rate calculations.

(5) The proposed disposition of crops grown;

(6) The proposed type and amount of all other soil amendments and nutrient sources to be used on the site;

(7) The proposed annual nitrogen loading and annual ~~heavy~~ metals loading calculations; and

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(m)(7) Nitrogen Loading | **BFI #56w BX,** |
| 10-19-98 | rfp | 10-19-98 | rfp | | |

**Comment:** Current nitrogen loading is already addressed in 806.07(m)(4) and (6).

**Response:** No Change

(8) ***Calculation of*** Cumulative ~~heavy~~ metals' loading to date; and

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(m)(8) Metal Loading | **Biogro #41w D,** |
| 10-5-98 | rfp | 10-19-98 | rfp | | |

**Comment:** Class A products are required to track cumulative metal loadings and soil testing for metals. The point of using these technologies is that you have produced a product that is really no different than other fertilizers. You are now in the bag of Agway. There is no justification for requiring this level of site work for these products.

**Response:** We have deleted this section.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(m)(8) Initial Loading | **Biogro #44w AF,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** For a first time biosolids or sludge application, it is not possible to calculate the cumulative heavy metals' loading to date as no material has yet been applied and therefore, the applicant would not be able to comply with this provision. **Cumulative heavy metals' loading is more appropriately monitored and tracked through any annual reporting requirements by the applicant to the department rather than as an up-front requirement to obtain a permit.**

**Response:** We have deleted this section.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.06(m)(8) Unnecessary | **BFI #56w BY,** |
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: This requirement is unnecessary, particularly in light of the proposed sludge metal standards.**

**Proposed Alternative: Provide analytical results for background heavy metals in actual soil at time that application is filed, as required in 806.10(a).**

**Proposed Language: Delete Env-Ws 806.07(m)(8).**

**Response:** We have deleted this section.

(*n*) Any other best management practice(s) ~~recommended by the UNH cooperative extension~~ which ~~will~~ ***shall*** be implemented at the site to ensure compliance with these rules.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(n) Agricultural Advisor | **Biogro #44w AG,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** As stated in previous comments, the UNH Cooperative Extension is not the only agricultural advisor which has prepared best management practices guidelines for biosolids use. There are numerous sources of best management practices which may be utilized on the site. **Therefore, the department should not limit itself just the guidance of UNH Cooperative Extension and this section should be revised as follows:**

**(n) Any other best management practice(s) by the UNH Cooperative Extension Service, NRCS or other advisors which will be implemented at the site to ensure compliance with these rules.**

**Response:** We have revised this section to incorporate most of your suggested language.

Env-Ws 806.08 Land Application Standards.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Grazing | **Citizens #1w I,** |
| 8-20/9-25-98 | mwr/rfp | 10-21-98 | gcb | | |

**Comment:** Waiting period for grazing after sludge application should be significantly increased. The present 30 day waiting period is not protective enough.

**Response:** We have extended the waiting period to 45 days.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Prohibit Grazing | **N.H.Sierra Club #38w D,** |
| 9-28-98 | rfp | 10-21-98 | gcb | | |

**Comment:**Prohibit animals from grazing on a sludged field.

**Response:** Revised the section

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Flood plain restrictions | **Citizens #1w L,** |
| 8-20/9-25-98 | mwr/rfp | 9-16-98 | gcb | | |

**Comment:** Land application should not be allowed within the 100 year flood plain. No other surrounding state permits this.

**Response:** We have revised the rules to prohibit land application within the floodway of the 100 year floodplain.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Flood Plain | **N.H.Sierra Club #38w B,** |
| 9-28-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Prohibit sludge spreading in floodplain areas.

**Response:** We have revised the rules to prohibit land application in the floodway of the 100 year floodplain.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07 Unique soils in N.E. | **Saffo # o D** |
| 8-27-98 | mwr | 9-16-98 | gcb | | |

**Comment:** Soils in the northeast are sufficiently unique that land application in the New Hampshire needs to be managed differently than proscribed in federal regulations. The regulations need to account for the soil characteristics of this area.

**Response:** UNH Cooperative Extension considers the soils types when they send us their recommended agronomic rate.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Other than Risk Based | **Mass WRA #46w B** |
| 10-7-98 | rfp | 10-21-98 | gcb | | |

**Comment:** We have particular concern with the limits on cumulative loadings in 806.08(l) and contaminant concentrations in 806.08(n) and (p). If the limits in these paragraphs were derived from risk assessment procedures or assumptions that differ from those used by EPA, those factors should be made easily available and open to public scrutiny and comment.

**Response:** The factors that DES will use to develop concentrations will be made available to the public.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 S-1 Standards | **Citizens #47w**, |
| 10-7-98 | rfp | | | | |

**Comment:** Do you plan to monitor the groundwater at all land application and reclamation sites? If not, then we agree with Ms. Rebecca Lawrence of DES Waste Management Division who stated that S-1 standards should not be used to determine the risk of these contaminants. (January 19, 1998 letter to Marc Morin, P.E. of BFI)

**Response:**

(a) No person shall land apply, stockpile, or otherwise manage sludge ***derived from human waste*** which ~~has not met~~ ***is not class A or*** class B ~~pathogen reduction requirements as specified in 40 CFR part 503.32 (b)(2), (b)(3), or (b)(4), and one of the vector attraction reduction requirements as specified in 40 CFR Part 503.33 (b)(1) through (b)(10)~~, anywhere other than:

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(a) Pathogen Content | **BFI #56w BZ**, |
| 10-7-98 | rfp | 10-19-98 | gcb | | |

**Comment: General Comment: This section is confusing and requires clarification.**

**Proposed Alternative: This section must contain provisions exempting (1) sludge which does not contain any pathogens (i.e. SPF®) from further processing, and (2) sludge stored for up to 8 months at a site permitted under these rules.**

**Response:** We revised the section to clarify our intent.

(1) A wastewater treatment facility permitted under RSA 485-A:13;

(2) A solid waste facility permitted under RSA 149-M; or

(3) A facility permit***ted*** pursuant to Env-Ws 808.

(b) No spreading of sludge shall be done on frozen or snow-covered ground or when the ground is saturated due to precipitation or flooding.

~~(c) When sludge is proposed to be mixed with any other material for land application, it shall be~~

~~thoroughly mixed prior to applying it to the land~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08© Mixing While Tilling | **NHWPCA #29w P**, |
| 9-23-98 | rfp | 10-27-98 | gcb | | |

**Comment:** In order to allow for the mixing of materials as they are tilled into the soil, "*..prior to applying it to land*" should be deleted from this sentence.

**Response:** We have deleted this section.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(c) Mixing | **Biogro #44w AH**, |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Biosolids have been used successfully with other products in agricultural and reclamation activities. Operationally, the most efficient and cost-effective method is to determine the application rate for each material and undertake the application by layering the material followed by incorporation into the soil. This is often the most effective method of keeping odors from moving off the site, thereby impacting abutters as it limits the biosolids activity and exposure to the air, which would increase with a mixing operation. This method of application is an industry standard. Furthermore, some materials, for example, newspaper, which can be used as a carbon source with biosolids in reclamation activities, are better managed on site by grinding and applying separately. **Requiring mixing of all products that may be used on-site with biosolids will eliminate a very important management option for site operators; therefore this section should be deleted.**

**Response:** We have deleted this section.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(c) "Thoroughly Mixed" | **BFI #56w CA**, |
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: The phrase "thoroughly mixed" is vague. Incorporation must be a permissible form of mixing.**

**Proposed Language: Delete Env-Ws 806.08 (c).**

**Response:** We have deleted this section.

(~~d~~c) No sludge shall be spread on agricultural land which has a slope greater than 15 percent, that is, a 15 foot rise in 100 feet.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 806.08 Slope Restrictions | **Citizens #1w K, N.H.Sierra Club #38w J** |
|---|---|---|---|---|---|
| 8-20/9-25-98 | mwr/rfp | 9-17-98 | gcb | | |

**Comment:** Applications of biosolids should be restricted to 8% slope. Allowing applications on 15% slopes will encourage run-off. Prohibit sludge spreading on slopes greater than 8% grade.

**Response:** DES believes that the incorporation requirement and the percent solids requirement adequately address the concerns of run-off from the land application of sludge on slopes greater than 8%.

(e*d*) Sludge spread on agricultural land which has a slope greater than 8 percent shall contain a minimum of 15 percent solids or be subsurface injected.

(f*e*) Sludge shall be spread in an even layer so as not to result in ponding or runoff of material.

(g*f*) Sludge which is to be land applied shall contain no visible or identifiable plastics or other non-biodegradable solids ***greater than 1" in the largest dimension***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(g) Screening Compliance | **NHWPCA #29w Q,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** It is important to screen foreign objects from organic residuals that are being land applied. It would be impossible, though, for organic residuals to be completely free of non-biodegradable materials. This should be changed to state that: ***Sludge which is land-applied shall contain no visible or identifiable plastics or other non-biodegradable solids***.

**Response:** We have revised this section to address your comment.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(g) Screening | **NHASH #54w K,** |
| 10-15-98 | rfp | 10-21-98 | gcb | | |

**Comment:** NHASH is not completely comfortable with this statement of screening. Perhaps it could be reworded to read: "Best Management practices should be used to remove as many of these plastics and non-biodegradable products as possible. " This definition would work here, but not in the septage application.

**Response:**We have revised this section to address your comment.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(g) De minimis | **BFI #56w CB,** |
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **<u>General Comment</u>: Sludge may contain de minimis concentrations of plastics or non-biodegradable solids. This paragraph should make provision for this.**

**Response:** No Change

(~~hg~~) No spreading of sludge shall be done on ~~any~~ very poorly drained soils;

***(h) No spreading of sludge shall be done in the floodway;***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(h) Soil Types | **<u>Town of Jefferson #16w</u>** |
| 9-8-98 | rfp | 10-19-98 | rfp | | |

**Comment:** No consideration was given to soil types although recommendations specific to soil types were made to the Advisory Committee. We feel this is an important part of determining whether land application should be permitted and would like to see these recommendations included in the Standards for Land application.

**Response:** The UNH Cooperative Extension takes into account soil types when it recommends the agronomic rate.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(h) Hydric Soils | **<u>Ken Kettenring #42w C</u>,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Should remain "hydric soils" (as defined by *Field Indicators for Identifying Hydric Soils in New England*). Hydric soils have saturation to the surface during at least part of the growing season.

**Response:** We have revised the section to address your comment.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(h) Very Poorly Drained Soil Application | **<u>P. Adams #33w K</u>,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Add: "..done on any poorly drained or very poorly drained soils.
REASON: By definition, poorly drained soils are hydric and wetlands which are supposedly prohibited land application areas. The Rules being superseded, i.e. Env-Ws 800, prohibited the spreading of sludge on hydric soils. Why is the prohibition being eliminated?

**Response:** Revised the section

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 806.08(h) Soil Characteristics | **BFI #56w CC,** |
|---|---|---|---|---|---|
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: Because certain soils can become very poorly drained at certain times of the year, this provision must consider the seasonal nature of groundwater movement. An example of this is on agricultural river bottom lands. These sites may flood for one month of the year, yet during the remaining growing season these sites could still benefit from a biosolids application. The department should also be consistent with the setbacks set forth in Table 806-I.**

**Response:** No Comment.

***(I) Animals shall not be grazed on land on which sludge has been land applied until 45 days after the last application of sludge unless methods to reduce adherence to the crop or vegetation are used***;

(*i*j) Sludge shall be incorporated into the soil within 48 hours of spreading unless it is used for top dressing.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Incorporation | **Citizens #1w H, N.H.Sierra Club #38w G,** |
| 8-20/ 9-25-98 | mwr/rfp | 10-21-98 | gcb | | |

**Comment:** The rules should require soil incorporation of sludge as recommended by a number scientists(The National Academy of Science Report, soil scientists, and toxicologists)NH encourages top dressing, the most risky of all application methods.

**Response:**

(j*k*) Reclamation and forest sites shall be posted with "~~No Trespassing~~***This is a sludge land application site. Enter at your own risk.***" signs ~~no more than 50 feet apart during reclamation and forest spreading activities~~. ***Such signs shall be printed with block letters no less than 2 inches in height, and with the name and address of the owner or lessee of the property. Such signs shall be posted not more than 100 yards apart on all sides and shall also be posted at gates, bars, and commonly used entrances.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(j) Posting | **NHWPCA #29w R,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The rationale for posting no trespassing signs at land application sites is to follow the management practices that are used in conjunction with Class B pathogen reduction standards in order to reduce the transmission of pathogens. It is important to note, that most animal manures, which contain many of the same pathogens as biosolids, are not required to be treated for pathogen reduction. Class B land application sites may well be safer than agricultural land to which animal manure is applied. The requirement for no trespassing signs would be more appropriate for a hazardous waste site than for a farm or a land application site. The EPA typically maintains that property boundaries are sufficient barriers to public access unless a site is very heavily used by the public. In the case of forest and reclamation sites, the NHWPCA recommends that one sign, stating that biosolids have been applied, be required for each side of the boundary of the land application site. No more than that is necessary.

**Response:** We have increased the distance between signs from 50 feet to 100 yards.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(j) Posting Perception | **Biogro #44w AI,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** This requirement sends a very alarming and negative message to the public. Research and demonstration projects throughout the United States have documented the benefits of using biosolids in both reclamation and forestry activities. However, these activities require the use of heavy industrial equipment and therefore access to the site should be limited and potential trespassers/invitees advised of the operation. Therefore, we recommend the following:

**(j) Reclamation and forest sites shall be posted with signs every 50 feet around the application area advising of the use of heavy equipment during reclamation and forest spreading activities.**

**Response:** We have modified the language that will appear on the signs.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(j) Posting | **NHASH #54w L,** |
| 10-15-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The posting "No Trespassing" could cause the loss of a 'In-Current Use' tax credit to the land owner, perhaps a 100 foot posting of sign possibly stating "Pass at your own risk- Sludge/Biosolids spreading area".

**Response:** We have modified the language that will appear on the signs.

~~(k) Any person proposing to land apply sludge at a reclamation site shall obtain a groundwater permit pursuant to Env-Ws 410~~ ,

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(k) groundwater Permit | **AF & PA #51w J,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** DES needs to revise 806.08(k) to clarify that a Groundwater Management Plan will be required, rather than a Groundwater permit. After several controversial policy decisions followed by recent meetings with DES staff, we understand that the Department has accept the concept of a groundwater management plan, for the application of sludge at "facilities" and "reclamation sites". AF&PA concurs with this decision and shares the Department's concern regarding the protection of groundwater quality. However, we are equally concerned that the regulatory burden and cost to comply with all of the requirements under Ws 1500 and Ws 1403 would effectively preclude the beneficial use of any sludge because of the extensive data requirements imposed by these regulations. It is far more appropriate and scientifically defensible for DES to require a groundwater permit only after determination that a consistent, statistically significant violation of Ambient Groundwater Quality Standards (AGQSs) exists. It is a waste of State and operator resources, with no additional environmental protection to assume that sites will violate automatically AGQSs across the board and require all operators to apply for a Groundwater Permit up front.

To implement the concept of Groundwater Management, AF&PA recommends that institutional measures be established that would not force the applicant to continue to monitor groundwater for the sole purpose of complying with a requirement for groundwater monitoring. We suggest the Department develop a set of Best Management Practices (BMPs) defining the degree of protection to be afforded at "facility" and "reclamation sites". Furthermore, we recommend that "reclamation sites" be defined as only those sites where greater than 5000 wet tons are applied and where a well is less than 500 feet from the land application area.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(k) Groundwater Permit | **NHWPCA #29w S,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Application rates of organic residuals are already limited to agronomic rates. Application rates commensurate with crop uptake rates, used in conjunction with best management practices, will ensure that reclamation projects using organic residuals have minimal impact to surface and groundwater. The amount of work and monitoring infrastructure required to obtain a groundwater permit for reclamation sites will eliminate the use of organic residuals for reclamation at all but the biggest reclamation sites. In reality, many smaller gravel pits and disturbed areas will remain unreclaimed if landowners can not use organic residuals to create topsoils capable of sustaining a lasting grass ecosystem. A groundwater permit should not be required for the land application of sludge at agronomic rates.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(k) Groundwater Permit | **Biogro #44w AJ,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The statutory intent of groundwater permits, as referenced in Env-Ws 410, is for groundwater discharge permits where the activity will result in a non-point source discharge to surface or groundwater, or if the site (soil) will actually be used to treat the wastewater. Reclamation activities do not meet these criteria. They are carefully managed activities that are designed and implemented to ensure that proper application rates are used for the site to establish the vegetative cover. There is extensive research on reclamation sites (sand and gravel pits, coal mines and contaminated soils sites) where applications of biosolids alone, or biosolids with a carbon source, have been applied with no negative impact to ground or surface water or the public health/environment. Requiring a groundwater discharge permit is not only unwarranted due to the extensive documentation about the safety of biosolids use in reclamation, but is cost prohibitive and will eliminate this reclamation option for most owners and municipalities.

The Department has extensive experience and knowledge in working with land appliers and municipalities in developing protective management techniques to be employed on site for these projects which makes groundwater monitoring unnecessary. **Therefore, this section should be deleted.**

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(k) Groundwater Permit | **White Mnt. RMI #49w L,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Research and monitoring programs at reclamation sites throughout the U.S. have shown that organic residuals can effectively reclaim disturbed land without having an adverse impact on water quality or wildlife. The costs associated with obtaining a groundwater permit and installing the required monitoring equipment would eliminate residuals reuse for reclamation in all but the biggest sites. Stockpile management and applying residuals at agronomic rates will ensure that sites can be reclaimed in an environmentally sound fashion. There is no justification for groundwater permits at these sites.

In addition to the use of S-1 soil standards as biosolids and residuals constituent concentration standards, DES is proposing to require groundwater monitoring for all reclamation activities in which biosolids or other residuals are used. There is absolutely no justification for requiring such extensive monitoring after providing evidence of residuals quality in the SQC process. Many of the same compounds of concern to the DES in residuals occur in other soil amendments for which there is no regulation.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(k) Groundwater Management Plan | **AF & PA #51w L,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** AF&PA recommends that a Groundwater Management would include, at a minimum, location and type of wells, rationale for well location, parameters for analysis, monitoring frequency, and general topography. It would also include the type/quantity/characteristics and frequency of sludge application, provisions for stockpiling, crop planting and harvesting objectives and the ultimate end use of the site being reclaimed.

The plan would also discuss practices for ground water protection through Best Management Practices. This plan will provide an adequate level of detail to demonstrate that the proposed application program is sufficiently protective of human health and the environment in the context of the specific sludge and specific site.

AF&PA believes that DES should recommend the use of BMPs being developed in the EPA/ASTSWMO *Guide to Industrial Waste Management*. If necessary DES in collaboration with industry representatives, UNH, Soil Conservation /Extension Service agents, and others, may alternatively develop BMPs specific to the State.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(k) Groundwater Permit | **BFI #56w CD**, |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: With the additional site controls (including but not limited to impervious pads and increased setbacks) and the more stringent sludge quality and certification standards, BFI Organics does not feel the requirement for a groundwater permit is scientifically justified or necessary to protect public health or the environment. Such permitting would impose substantial additional expense.**

**Response:**

(l) All sludge and mixtures of sludge to be land applied shall not exceed any of the following lifetime cumulative pollutant loading rates:

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Non-degradation | **Clean Water # o C** |
| 8-25-98 | mwr | 10-21-98 | gcb | | |

**Comment:** DES should use a non-degradation policy to limit metals loading to land application sites. The proposed cumulative loading limits are not sufficiently protective of the environment.

**Response:**

(1) For arsenic, 5 kilograms per hectare or 4.5 pounds per acre;

(2) For cadmium, 2.5 kilograms per hectare or 2.2 pounds per acre;

(3) For chromium, 140 kilograms per hectare or 125 pounds per acre;

(4) For copper, 180 kilograms per hectare or 160 pounds per acre;

(5) For lead, 200 kilograms per hectare or 178.6 pounds per acre;

(6) For mercury, 5.6 kilograms per hectare or 5.0 pounds per acre;

(7) For molybdenum, 18 kilograms per hectare or 16 pounds per acre;

(8) For nickel, 50 kilograms per hectare or 44.6 pounds per acre;

(9) For selenium, 100 kilograms per hectare or 89 pounds per acre; and

(10) For zinc, 320 kilograms per hectare or 285.7 pounds per acre.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07, Cumulative load limits | **Hanson # o** |
| 8-27-98 | mwr | 10-21-98 | gcb | | |

**Comment:** The cumulative load limits proposed in the rules are not risked-based and are overly stringent.

**Response:** Revised the section

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Cumulative Copper loading | **Town of Meredith #11w C** |
| 9-8-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The EPA limit is 1500 kg/ha. Why is the State proposing the unrealistic limit of 180 kg/h? More spreading sites will be needed to meet this artificial load limit.

**Response:** Revised the section

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(l) Cumulative Tracking | **Biogro #44w AK,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Tracking of cumulative loadings of metals on a land application site is tied to biosolids materials that have pollutant concentrations above 503 Table 3 values but do not exceed the ceiling concentrations in 503 Table 1. EPA has clearly stated that the need for tracking of metals does not apply to biosolids that meet the Table 3 standards. Since New Hampshire has proposed Table 3 standards (or more stringent values) for all biosolids to be land applied within the state, **the requirement for tracking of cumulative metals loading should be deleted**. The 503 risk assessment has clearly demonstrated that biosolids with metal concentrations below the Table 3 standards do not result in a net increase in soils metal levels.

While tracking of cumulative metals should be a moot issue for biosolids that meet 503 Table 3 standards, there are a number of inconsistencies between New Hampshire values and 503 Table 2 values for cumulative loadings rates that should be addressed. The standards for cumulative loadings of pollutants in 806.08 (l) diverge from the 503 Table 2 Cumulative Pollutant Loading rates as follows:

- The 503 Table 2 value for arsenic is 41 Kilograms per hectare or 36.3 pounds per acre;
- The 503 Table 2 value for cadmium is 39 Kilograms per hectare or 34.8 pounds per acre;
- Chromium was eliminated from the 503 regulations;
- The 503 Table 2 value for mercury is 17 Kilograms per hectare or 15.2 pounds per acre;
- The ceiling pollutant concentration limit for Molybdenum was changed to 75 mg/kg; there currently is no limit for cumulative loadings.

Unless the state can provide demonstrable scientific evidence of an increased risk from these metals due to specific situations in New Hampshire, there is no basis for these metal values to be more stringent than the 503 values.

Many of the regulated metals are also important crop nutrients. The Bureau of Health Risk Assessment, in undertaking its review of the federal EPA 503 metal standards, did not identify a need for additional cumulative metal loading tracking for biosolids or residuals which met the Table 3 (EPA 503) pollutant concentrations (even as revised for mercury, arsenic and cadmium). **Therefore, cumulative metal loading tracking for Class B land application sites using biosolids which meet the stringent quality standards (concentrations) should not be required.**

**Response:** Revised the section

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(l) EPA Table I Standards | **BFI #56w CE**, |
| 10-19-98 | rfp | | | | |

**Comment:** General Comment: During the USEPA's risk assessment it was determined that tracking cumulative heavy metal load was unnecessary if the sludge being land applied met the Table I standards found in 40 CFR 503.13. This determination was made after an extensive peer review by the scientific community of data on heavy metal fate and transport in soils. In addition to the USEPA's risk assessment, the New Hampshire Department of Health and Human Services (NHDHHS) also conducted their own risk assessment and concluded that the Federal standards were protective of human health with the exception of arsenic, mercury and cadmium compounds. For these compounds the NHDHHS, using a more conservative model, developed their own risk-based standards for heavy metals. The department's proposal of sludge heavy metal standards more stringent than the USEPA and NHDHHS standards and their requirement of tracking of cumulative loads is not scientifically based.

What is the definition of "lifetime cumulative pollutant loading rates"? See also comment on 806.08(n)(12)

**Proposed Language: Because these rules already require compliance with the federal land application standards, Delete Env-Ws 806.08 (l).**

**Response:**

~~(m) Prior to January 1, 2001, all sludge and mixtures of sludge which are to be land applied shall not exceed the concentrations specified in the regulations of the state in which the sludge was generated or the following concentrations in (n) below, whichever is more stringent.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(m) Irrational and Unjust | **BFI #56w CF**, |
| 10-19-98 | rfp | | b | | |

**Comment:** General Comment: Additional standards should not be adopted starting January 1, 2001, because there is no risk-based, peer-reviewed rationale for doing so, and the additional cost is not justifiable.

**Response:**

***(m) Contaminants in soil at land application sites shall not exceed the NH S-1 soil standards in table 3 of the Contaminated Sites Risk Characterization and Management Policy dated January 1998 as a result of land application of sludge.***

~~(n) All sludge and mixtures of sludge to be land applied under (m) above, shall not exceed the following concentrations, expressed as total concentration on a dry weight basis:~~

~~(1) For arsenic, 32 mg/kg;~~

~~(2) For cadmium, 14 mg/kg;~~

~~(3) For chromium, 1000 mg/kg;~~

~~(4) For copper, 1500 mg/kg;~~

~~(5) For lead, 300 mg/kg;~~

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~~(6) For mercury, 10 mg/kg;~~

~~(7) For molybdenum, 35 mg/kg;~~

~~(8) For nickel, 200 mg/kg;~~

~~(9) For selenium, 28 mg/kg;~~

~~(10) For zinc, 2500 mg/kg;~~

~~(11) For PCB's, 1.0 mg/kg; and~~

~~(12) For dioxin, 10 ng/kg for 2,3,7,8 TCDD and 2,3,7,8 TCDF; and 27 ng/kg for all Toxic Equivalents.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(n) Dioxin Standards | **BFI #56w CG,** |
| 10-19-98 | rfp | | | | |

**Comment:** (12) ~~For dioxin, 10 ng/kg for 2,3,7,8 TCDD and 2,3,7,8 TCDF; and 27 ng/kg for all Toxic Equivalents.~~ For dioxin and for all toxic equivalents for dioxin using the 1987 toxicity equivalency factors (tef) as defined in the USEPA Interim Procedures for Estimating Risk Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and Dibenzofurans (CDDs and CDFs), Risk Assessment Forum, Washington, DC, EPA/625/3-87/012, 1987.

**General Comment: The USEPA is currently revising its dioxin standards. To date, BFI Organics is aware of only one dioxin standard that has undergone a thorough peer review, Maine's dioxin standard of 27 ng/kg using the 1987 toxic equivalency factors (tef). Because BFI Organics believes all regulations should be based on peer reviewed scientific data, BFI Organics proposes the Department use a dioxin standard of 27 ng/kg for all sludges to be land applied.**

**Response:**

~~(o) On or after January 1, 2001, all sludge and mixtures of sludge which are to be land applied shall not exceed the following concentrations specified in the regulations of the state in which the sludge was generated or the following concentrations in (p) below, whichever is more stringent.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(o) Unwarranted Limits | **Biogro #44w AL,** |
| 10-5-98 | rfp | 11-10-98 | gcb | | |

**Comment:** The New Hampshire standards for land application are far more stringent than the pollutant concentration standards specified in the EPA 503 rule for exceptional quality materials suitable for unrestricted marketing and distribution. The EPA 503 values are based on extensive research and comprehensive risk assessment. The extra degree of conservatism embodied in the proposed New Hampshire values lacks a sound technical foundation and is unwarranted. **The state should reference 40 CFR 503.13 (b)(3) Table 3 Pollutant Concentration Values.**

There are a number of inconsistencies between New Hampshire values and 503.13 Table 3 values for pollutant concentrations that should be addressed. The standards for pollutant concentrations in 806.11 (h) diverge from the 503.13 Table 3 Pollutant Concentrations as follows:

Arsenic, 41 mg/kg;
Cadmium, 39 mg/kg;
Chromium, 1,200 mg/kg - but eliminated later from the federal rule;
Copper, 1,500 mg/kg;
Lead, 300 mg/kg;
Mercury, 17 mg/kg;
Molybdenum, -----;
Nickel, 420 mg/kg;
Selenium, 36 mg/kg;
Zinc, 2,800 mg/kg

The proposed changes to the Table 503 amounts would create a strong economic disincentive to many treatment plants to develop a municipal and industrial biosolids recycling program. The cost to the generator to meet these standards will be substantial. Many generators will be unable to meet the standards, especially for copper and zinc, which are essential crop nutrients. The assumption of the Department is that the source of all metals is industry, which is not true. The primary source of these metals is domestic plumbing, which is not in the control of the generator. To be able to lower these metal levels, the generator would need to install plastic plumbing in the homes of all their residential users. With the lack of metals standards for septage (as then every truckload would require testing), these regulations are promoting a popular myth that biosolids are somehow bad because they contain metals. All soil amendments (commercial fertilizers, manures, composts, mined phosphates, etc.) contain metals. However, unlike many other soil amendments on the market, biosolids have been extensively researched and their safety documented. The EPA has spent considerable time and effort in developing a comprehensive regulatory program to insure that biosolids produced in the United States are environmentally sound and protective of public health, and more importantly, the quality of those biosolids will support sustainable recycling programs. Therefore, the Department should retain its original pollutant concentrations (Table 503) with the recommendations of the BHRA.

**Response:**

~~(p) As of January 1, 2001, all sludge and mixtures of sludges to be land applied under (o) above, shall not exceed the following concentrations, expressed as total concentration on a dry weight basis:~~

~~(1) For arsenic, 10 mg/kg;~~

~~(2) For cadmium, 10 mg/kg;~~

~~(3) For chromium, 160 mg/kg;~~

~~(4) For copper, 1000 mg/kg;~~

~~(5) For lead, 270 mg/kg;~~

~~(6) For mercury, 7 mg/kg;~~

~~(7) For molybdenum, 18 mg/kg;~~

~~(8) For nickel, 98 mg/kg;~~

~~(9) For selenium, 18 mg/kg;~~

~~(10) For zinc, 1780 mg/kg;~~

~~(11) For PCB's, 1.0 mg/kg; and~~

~~(12) For dioxin, 10 ng/kg for 2,3,7,8 TCDD and 2,3,7,8 TCDF; and 27 ng/kg for all Toxic Equivalents.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Flawed Data-base | **NHWPCA #29w T**, |
| 9-23-98 | rfp | | | | |

**Comment:** The database used by the DES to determine the 2001 trace metal if fundamentally flawed for two reasons. First, sludge trace metal concentrations are often not indicative of influent quality. Second, the database contained erroneous, misleading and incomplete information. (Please see copy of the August 28, 1998 NHWPCA letter to Commissioner Varney for a detailed explanation of the shortcomings of the 2001 trace metal limits). Trace metal limits should be based on risk-based concentrations, as in 806.08 (n), not on flawed statistical analysis with inaccurate assumptions.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) IPP head works loading limits | **Manchester #4w** |
| 8-21-98 | mwr | 9-16-98 | gcb | | |

**Comment:** The metals limits proposed in the draft rules will result in sever reduction of headworks loading limits. In turn industrial permittees will be required to meet extremely stringent local limits, if they can be meet at all. The net result will be that towns with local limits predicated on sludge reuse will be unattractive to industry because of these limits. DES should review the BPT and BAT limits in the 403 regulation and consider lengthening the time to prepare for the 2001 limits.

**Response:** The Department is presently working with pretreatment communities like yours to determine the effect of our 2001 limits on industrial permittee's sludge to not only ensure that they can continue to discharge but also to continue to attract industries.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Lenient Metal limits | **Loder, Clean Water # o A** |
| 8-25-98 | mwr | | | | |

**Comment:** Metals limits proposed in these rules are too high and still represent a risk to human health and the environment.

**Response:**.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Metal Limits | **N.H.Sierra Club #38w P,** |
| 9-28-98 | rfp | | | | |

**Comment:** Heavy metal limits should not exceed 1/10th the US EPA 503 heavy metal limits and/or Cornell WMI Table 10 heavy metal limit recommendations.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Reduce Cu, Zn, Ni limits | **Clean Water # o D** |
| 8-25-98 | mwr | | | | |

**Comment:** Since zinc, copper, and nickel are potentially phytotoxic and could effect long-term soil productivity, the limits for these metals should be reduced by a factor of ten.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Reduce Cadmium limit | **Clean Water # o E** |
| 8-25-98 | mwr | | | | |

**Comment:** The cadmium limit should be reduced because of the potential risk to human health and wildlife.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Mercury limits | **Clean Water # o F** |
| 8-25-98 | mwr | | | | |

**Comment:** Considering recent research on methyl mercury levels in sludge and mercury levels in the air over land applications sites, the acceptable level of mercury in sludge should be less then 2 kg/kg.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Copper Limit | **Town of Meredith #11w B,** |
| 9-8-98 | rfp | | | | |

**Comment:** Suggesting to adopt 1500 mg/kg limit, even though we cannot politically pat ourselves on the back saying this is the lowest in New England. It appears the 2001 policy standards are based on either flawed or inconclusive information or analysis, or political motivation.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Science based metals limits | **Townsend, Plymouth W & S Dist. #10w B, House E & A Committee #18w B,** |
| 8-26-98 | mwr | | | | |

**Comment:** The metals limits for sludge should be science-based. The proposed 2001 limits are unnecessarily restrictive.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p), 2001 Limits as Goals | **Stenkovich, Keene #32w A NHWPCA #29w B, NEBRA #31w D,** |
| 8-27-98 | mwr | | | | |

**Comment:** The limits proposed for 2001 should be goals or limits which trigger a reduced regulatory burden rather than absolute ceiling limits. Such best attainable metals' standards should be presented as target levels encouraged through a voluntary incentive-based program, not as regulatory requirements.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Metals limits, use 503 | **Pratt, Town of Hooksett #24w A, BioGro #9w B ,** |
| 9-4-98 | rfp | | | | |

**Comment:** The metals limits proposed for 2001 are overly stringent. DES should continue to use the EPA 503 metals standards.
**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) 2001 Metal Limits | **City of Nashua #7w A, Alwynn Hellfach #22 A,** |
| 9-4-98 | rfp | | | | |

**Comment:** The current data used to compile the 99th percentile is based on only 33 of the State's 85 WWTFs and the data appears to have several inconsistencies. This is a misrepresentative of State sludges.

**Response:** The Department has received additional sludge data from many of the wastewater treatment facilities which is being included in the data-base. Further, we are collecting samples of sludge from 20 facilities, and once analyzed will also incorporate the results into the data-base. Finally, this data set will be sent to Dr. Tom Baellestero at UNH to review and to determine the 99th percentile

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 2001 Metal Limits | **USEPA #8w A** |
| 9-4-98 | rfp | | | | |

**Comment:** Adequate justification for limitations developed in this method are difficult to defend. For example, in 1195, EPA revised its selenium limit from 36 to 100 mg/kg because the DC Circuit Court found that the basis for the initial limitation did not support the statue which requires a demonstrated link between risk and any pollutant concentration limits adopted by the agency.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Risk Based Assessment | **Shevenell-Gallen #13w,** |

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| | | | | | |
|---|---|---|---|---|---|
| 9-8-98 | rfp | | | | |

**Comment:** New Hampshire Risk Based Assessment of soil standards is regulated under the DES policy "Risk Characterization and Management Policy", dated Jan. 1998. In view of the fact that these Method 1 standards have been found to be protective at all locations in New Hampshire, it is reasonable to recommend that they be used as the basis for limits imposed on sludge which is to be land spread in New Hampshire. The current approach to setting standards most conservative in New England is unnecessary because paragraph 806.08 (o) already requires that an out-of- state source of sludge must meet the concentration standards of that state. Please reconsider the year 2001 standards and bring them into agreement with the Method 1 standards.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 S-1 Soil Standards | **White Mnt. RMI #49w Q,** |
| 10-13-98 | rfp | | | | |

**Comment:**

1. RMI is aware that the Department is considering the use of Method 1, S-1, risk-based soil standards as standards for the concentration of constituents in biosolids and industrial sludges. The S-1 standards were derived from soil concentrations, not from the concentrations of constituents found in materials applied to soils. Soil standards should not be used as standards for soil amendments. DES appears to be turning to the S-1 standards due to a perceived lack of risk assessment work performed on the occurrence of organic compounds in residuals that are recycled in land application programs. The EPA, however, performed an extensive risk assessment on the organic compounds that occur in biosolids.

Risk assessments performed in the mid 1980s by EPA staff determined that, at the levels that were found in biosolids, none of the organic compounds that typically occur in biosolids would pose a significant health risk, by way of soil or groundwater, when biosolids were land applied. This determination was made using very conservative assumptions, including biosolids application rates of 500 Mg/ha, shallow depth to groundwater and soils with high hydraulic conductivity. Since the time of the original risk assessment, levels of the organic compounds occurring in biosolids has been steadily declining, adding an extra level of protection to the original conclusions. RMI suggests that DES consult with the staff at the EPA that were involved with the original biosolids risk assessment to better understand the science behind the conclusions reached in that risk assessment process.

2. If DES wants to be more conservative than the federal government in designing land application standards, it is imperative that new standards be scientifically-based. One approach would be to use S-1 standards that are adjusted to reflect soil concentrations after amendments are added to soil. For instance, if the concentration of an organic compound in biosolids was two times the S-1 standard, but application rates of the biosolids would lead to a 20:1 soil:biosolids dilution, the final soil concentration would obviously meet the S-1 standard. Adjustment of the S-1 standards to reflect the final soil concentrations is the only scientifically justified application of these standards to biosolids and other residuals. The Maine DEP took a similar approach in adapting the EPA Region 3 risk-based concentrations (RBCs) for 598 contaminants in air, drinking water, fish tissue and soil to screening standards for residuals in their draft agronomic utilization regulations (Chapter 419).

3. The S-1 soil standards should not be applied to stockpiled material. Land application sites typically have public access restrictions that would prohibit the public from having direct, or dermal contact with the material. Stockpiles are shaped to shed run-off, and consequently should not have significant quantities of precipitation percolating through the stockpiles and into groundwater.

4. RMI suggests that for residuals that do not meet the adjusted S-1 standards, a groundwater monitoring program be required for one representative reclamation site. This is more conservative, obviously, than federal standards for monitoring, but will allow DES to build a more comprehensive database on the water quality impacts from land application programs that are performed in accordance with best management practices and agronomic rates.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Risk Based Limits | **BIA #15w C,** |
| 9-8-98 | rfp | | | | |

**Comment:** With the exception of As, Ca and Hg, the New Hampshire Bureau of Health Risk Assessment has not identified any metals which the Federal "Section 503" rules do not provide adequately protective standards.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) 2001 Metal Limits | **Town of Hooksett #6w A , State Senate #27w B** |
| 9-9-98 | rfp | | | | |

**Comment:** The Hooksett Sewer Commission is opposed to the proposed ceiling limits for heavy metals and Class B sludge to be effective January 1, 2001. The Proposed metal limits after January 1, 2001, are excessively strict. It is very likely these limits can't be met. They are numbers someone came up with simply to be the lowest in the region.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Irresponsible Precedent | **NEBRA #31w F,** |
| 9-14-98 | rfp | | | | |

**Comment:** NEBRA must voice concern regarding the irresponsible precedent New Hampshire would be setting in adopting the proposed 2001 metals' standards. NEBRA's concerns are echoed by other states and by the USEPA. Most New England states are moving toward adopting metals' standards at or close to the Federal 503 standards. NEBRA encourages New Hampshire to do so as well.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Dioxin Levels | **Citizens for a Future N.H. #37w** |
| 9-25-98 | rfp | | | | |

**Comment:** The risk-based limits for dioxin should be re-evaluated. They are much too high. More recent and valid data on the adverse health effects of dioxin are available (Testimony before the House Environment and Agriculture Committee, dated Jan. 28, 1998) and should have been used by DES.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Dioxin Limit | **N.H.Sierra Club #38w N,** |

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| | | | |
|---|---|---|---|
| 9-28-98 | rfp | | |

**Comment:** Dioxin levels should not exceed 1ppt (total TEQ).

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Voluntary Metals-Reduction Program | **NEBRA #43w A**, |
| 10-6-98 | rfp | | | | |

**Comment:** Regarding an incentive program for lower metals: NEBRA strongly supports the concept of a voluntary metals-reduction program aimed at target levels lower than the proposed 1998 risk-based metals limits.

To get an incentive to work, there must be monetary or energy savings. Members suggest that
a) by making the metals-reduction program voluntary, DES will avoid the "unfunded mandate" concern;
b) by offering matching funding from DES to leverage local funding for metals reduction, an incentive could be created especially if the level of state funding was significant and increased as the actual metals levels decreased.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) 99th Percentile | **Merrimack #45w B**, |
| 10-7-98 | rfp | | | | |

**Comment:** We have significant concerns regarding the adoption of regulatory limits based on the 99th percentile of sludge quality of our State's wastewater treatment plants and not basing these limits upon environmental or health risk standards.

Our headworks loadings is below detection levels for all federally regulated metals except for traces of copper and lead and higher concentrations for zinc. These are directly and indirectly related to corrosive water supplies. This source of metals is an uncontrollable source unless the water supply companies agree to use an alternative corrosive control chemical.

Charts from EPA's "Septage Treatment and Disposal" data-base , dated 1977, indicate that septage loadings from metals can have a significant impact on wastewater treatment facilities. The result of developing more restrictive technological standards in effect may force many treatment facilities to consider reducing the septage loadings in order to preserve headworks loadings for their current and future industrial base. This may require only accepting Merrimack's septage and reducing the amount of septage from other communities.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Risk Assessment | **Merrimack #45w C**, |
| 10-7 / 10-14-98 | rfp | | | | |

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**Comment:** We believe that New Hampshire Department of Environmental Services rule making for heavy metal concentrations and cumulative loading limits should continue to be based upon the extensive risk assessment completed by the USEPA for the 40 CFR Part 503 rules. We support the Bureau of Health Risk Assessment performed on arsenic, cadmium, and mercury because they are based on science and are manageable. We encourage the NHDES to continue to develop risk based scientifically defensible limits for pollutants of concern while incorporating pollution prevention education as part of an overall policy of sound biosolids management.

We believe establishing regulatory limits for metal concentrations and cumulative loading limits that are more stringent than 40 CFR Part 503 that cause municipally owned or operated WWTPs to incur greater local costs may be subject to legal challenge. Attorney, Judy Silva, from NH Municipal Assoc., raises this point very succinctly in her correspondence to you, dated August 31,1998.

We do not object to establishing more stringent limits foe metal concentrations and cumulative loading rates as goals for NH's municipally owned and operated WWTPs. Should the State, through your Agency's rulemaking, establish more stringent requirements as goals, instead of mandated levels, the State could consider appropriating funds to help offset some of the capitol costs incurred by municipalities who elect to achieve these goals.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Flawed Data-Base | **White Mnt. RMI #49w K,** |
| 10-13-98 | rfp | | | | |

**Comment:** The database used to derive these numbers is fundamentally flawed. DES has recognized errors in their calculation, and is taking steps to address these flaws. RMI supports the use of risk-based concentration limits and believes that there is no place in the regulations for standards based on the 99$^{th}$ percentile of an inaccurate data set. Trace metal concentrations in biosolids recycled in New Hampshire are generally very low. Soil testing at land application sites, in New Hampshire and throughout New England, demonstrates that even after repeat applications, soil metal levels are not significantly increased.

There does not appear to be any justification for setting trace metal limits lower than risk-based concentrations. In fact, biosolids have been used to reduce metal mobility in metal-contaminated soils. Restricting the amount of biosolids that is available for land application may actually result in New Hampshire soils that are more poorly buffered relative to metals mobility.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(p) Unobtainable Limits | **NHASH #54w M,** |
| 10-15-98 | rfp | | | | |

**Comment:** These limits seem unobtainable. Conductive to the end disposal of any wastewater treatment sludge product in the year 2001, what then? Landfills will not be an option for long. Are these risk based and confirmed health risk protection limitations?

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 80608(p) Ambient Level | **Clean Water #55w B,** |
| 10-14-98 | rfp | | | | |

**Comment:** More can and should be done to virtually eliminate the most toxic of these metals from land applied sludge. We, along with many European governments, are guided by the principle that we shouldn't increase these hazardous elements beyond the ambient levels found in soil, especially agricultural soil, rather than attempting to apply the maximum allowable under some imperfect risk-assessment scheme. That said, we will continue to argue for heavy metal standards more in line with science-based recommendations of Cornell Cooperative Extension (1998). We are very concerned that your rules, even under 2001 reductions, will allow much too much cadmium and mercury to be deliberately spread about the landscape in New Hampshire

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 80608(p) Cadmium | **Clean Water #55w C,** |
| 10-15-98 | rfp | | | | |

**Comment:** "Cornell Recommends" states that "cadmium in adult human diets in industrialized countries is estimated to average about 25-50 percent of the acceptable daily intake limit, and young children may already exceed the acceptable limit. Therefore, further increases of cadmium in food crops should be avoided." It goes on to recommend a soil cadmium maximum concentration of 2 ppm. At the very least, this argues for further restrictions on sludge use at or near these levels in the cases of food crop and/or top dressing applications.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 80608(p) Mercury | **Clean Water #55w D,** |
| 10-14-98 | rfp | | | | |

**Comment:** Given this element's notoriety regarding fish consumption advisories and regional/state reduction strategies, we find it particularly disappointing that tighter restrictions are not pursued. The New England Governors/Eastern Canadian Premiers Conference (which Governor Shaheen currently chairs) 1998 Mercury Action Plan requires a 50 percent reduction in mercury emissions in 5 years and a goal of virtual elimination of human sources by a still-to-be determined date. An earlier draft (11/18/96) of New Hampshire's own Mercuy Reduction Strategy recommended a 2 PPM limit on mercury in sludge, stating that most in-state treatment plants could meet it. A revised draft (7/98) states that a comprehensive evaluation of NH applied sludge found that 99 percent had values less than 4.8 ppm. This information, already obtained and reported by DES, makes us wonder why a tighter standard for mercury couldn't be imposed.

We are appalled that the NHWPCA, and apparently DES, argue that these standards will force most sludge to be simply landfilled, rather than trying to figure the (perhaps lower) costs of increased industrial pre-treatment

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(o)&(p) Cumulative Load Tracking | **BFI #56w CH,** |
| 10-19-98 | rfp | | | | |

**Comment:** General Comment: During the USEPA's risk assessment it was determined that tracking cumulative heavy metal load was unnecessary if the sludge being land applied met the Table I standards found in 40 CFR 503.13. This determination was made after an extensive peer review by the scientific community of data on heavy metal fate and transport in soils. In addition to the USEPA's risk assessment, the New Hampshire Department of Health and Human Services (NHDHHS) also conducted their own risk assessment and concluded that the Federal standards were protective of human health with the exception of arsenic, mercury and cadmium compounds. For these compounds the NHDHHS, using a more conservative model, developed their own risk-based standards for heavy metals. The department's proposal of sludge heavy metal standards more stringent than the USEPA and NHDHHS standards and their requirement of tracking of cumulative loads is not scientifically based.

What is the definition of "lifetime cumulative pollutant loading rates"? See also comment on 806.08(n)(12)

**Proposed Language: Delete 806.08(o). and (p)**

**Response:**

~~(q) For the constituents required to be analyzed under Env-Ws 807.05(b) which are detected in the sludge, the applicant will propose for department approval, or the department will develop in consultation with the department of health and human services, site-specific standards. These standards will be developed by risk assessment methods described in the United States Environmental Protection Agency's Soil Screening Guidance, EPA/540/R-96/018 dated April 1996, the American Society for Testing and Materials E-1730-95 entitled "Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites" dated November, 1995, or equal.~~

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

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| date | initials | date | initials | 806.08(q) Undeveloped Standards | **BioGro #44w AM,** |
|---|---|---|---|---|---|
| 10-5-98 | rfp | | | | |

**Comment:** This provision would require a risk assessment for each analyte (compound) detected from the list in Env-Ws 807.05 (b). Furthermore, site specific standards would be developed based upon those detection amounts and the completed risk assessment. This is overly burdensome, unnecessary and onerous. Also, the development of site specific standards is vague and open to misinterpretation and arbitrary and capricious decisions.

The USEPA, in developing the federal standards, evaluated the presence of these compounds in biosolids to determine what, if any, standards (concentration) should be developed. The panel of scientists who reviewed the research and developed the regulations determined that it was unnecessary to promulgate concentration levels and site specific standards for these compounds, based upon their low presence in biosolids and their characteristics when land applied. It is not appropriate or scientifically sound to apply soil contamination standards from petroleum sites to biosolids. These standards and risk assessment protocols were developed primarily to address environmental impacts, as the result of underground storage tank leaks, and not land application or biosolids recycling programs. Research has demonstrated that these compounds are not present in high levels and that they do not persist through either the treatment process or in the soil following land application. **Therefore, this section should be deleted.**

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(q) Site Specific Standards | **NHASH #54w N,** |
| 10-15-98 | rfp | | | | |

**Comment:** This standard, as spelled out here would make more stringent suggestions, based on guidelines named in (q), would they also make some restrictions more lax, based on history and SQC and the named guidelines to protect public health?

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(q) Unstandardized | **BFI #56w CI,** |
| 10-19-98 | rfp | | | | |

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**Comment: Delete current (q) and substitute the following:** The land application standards for the constituents required to be analyzed under Env-Ws 807.05(b) shall be those specified in the draft dated April 1998 of the Maine Solid Waste Management Rules, Agronomic Utilization of Residuals, Chapter 419.

General Comment: BFI Organics finds it alarming that the Department is requiring the analysis of organic constituents identified in Env-Ws 807.05(b) without having an adopted standard. Given the variables present at each land application site (e.g. soil chemistry, soil structure, topography, etc.) it will be cost and time prohibitive to model each constituent under the varying conditions. In addition, modeling can be a subjective process producing unpredictable results. (See also General Comment on 807.05(k).)

**Response:**

(*rn*) No person shall land apply or store sludge within the buffer areas specified in Table 806-I, subject to ~~the notes in (r)~~*(s)* below:

Table 806-I
Buffer Distances (in feet)

| For Land Application: | SLUDGE |
|---|---|
| Surface Water: | 125[a] |
| Non-tidal Drainage Ditch: | 33 |
| Community Wells[b]: | 400 |
| Other Wells: | 300 |
| Surface Drinking Water Source: | 500 |
| Property Lines: | 100[c] |
| Public Roads other than Federal Interstate Highways: | 25 |
| Federal Interstate Highways: | 10 |
| On-site Occupied Dwelling: | 100 |
| Off-site Occupied Dwelling - | |
| If used for top dressing: | 500[d] |
| If incorporated within 48 hours: | 200[d] |
| Bedrock / Restrictive Layer: | 2 |
| Groundwater Depth: | |
| Reclamation: | 4[e] |
| Land Application: | 2[e] |
| **For Stockpiling or Storage :** | |
| Surface Drinking Water Source: | 500 |
| Nearest Occupied Dwelling: | 500[f] |
| Nearest Well: | 500[g] |
| Property Line: | 500[c] |

Bedrock / Restrictive Layer: 4
Groundwater Depth: 6h
Surface water: 250
Non-tidal Drainage Ditch: 100

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Buffer distances | **Citizens #1w M,N,O, Citron A, Hartman** |
| 8-20/9-25-98 | mwr/rfp | 9-16-98 | gcb | | |

**Comment:** The following buffer distances are inadequate:
1) Buffer distances to roads which have been reduced in the draft rules should be restored to the distances in the present rules.
2) Depth to bedrock and groundwater are insufficient and should be more protective.
3) Buffer distances to surface waters are not as protective as adjacent states and should be increased.

**Response:** Since DES believes that the buffer distances are adequate to protect public health and the environment, we will not incorporate your suggested changes.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Class A Watershed | **N.H.Sierra Club #38w E,** |
| 9-28-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Prohibit using sludges in any watershed of a class A water body.

**Response:** Since we believe that sludge, when managed properly, can safely be applied in a Class A watershed without causing adverse effects on public health and the environment, we have not incorporated your suggested change to the proposed rules.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08 Increase Buffer Distances | **N.H.Sierra Club #38w I,** |
| 9-28-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Setbacks from wells and water bodies need to be lengthened.
300 feet from non-Class A surface waters.
500 feet from any well.
**Response:** Refer to our response to similar comments from the N.H. Sierra Club.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | Table 806-I Buffer distances | **Ken Kettenring #42w D,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:**
1. Groundwater depth - What is the justification for reduction to two feet? The "e" superscript would allow sludge application in most wetlands!

2. Bedrock depth - What is justification of reduction to 2 feet?

3. Wetlands - No setback to wetlands? Heavy nutrient loading can have a significant negative impact on the wetland.

4. What is the difference between a Interstate Highway and a Federal Interstate Highway? Do you mean Intrastate Highway for the first?

**Response:** Refer to our response to similar comments from the N. H. Sierra Club.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.08(r) Buffer Distances | **BioGro #44w AN,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment: Surface waters**: We recommend that this definition include a clarifying footnote that permits biosolids application within 50 feet of intermittent streams or the center line of agricultural grassed waterways for all methods of biosolids application on a site.

**Other Wells**: Why is the buffer distance for land application of biosolids twice the distance required between home wells and septic systems? Septic systems provide continuous year-round dosing of untreated wastewater directly into the subsoil. Biosolids, on the other hand, are treated to reduce pathogens and are applied, at the most, yearly at a controlled rate as an agricultural fertilizer. Where is the increased risk that would warrant a buffer distance twice as stringent as that for septic systems? In addition, since wells are typically in close proximity to residences, buffer distances for each should be coordinated to streamline the identification and marking of buffer distances. **Since the minimum distance from a well to a septic system is 75 feet, the buffer distance to wells should also be 75 feet.**

**Distance to bedrock and groundwater**: The six-foot buffer for temporary field stacking sites is excessive and inappropriate. The four-foot buffer distance is appropriate for long-term storage sites. A one-time, temporary stockpiles in a field do not pose as great a risk of nitrate leaching and are necessary to properly coordinate land application of biosolids with a farm's agricultural operations. **We recommend that the buffer required for temporary storage of 90 days of less be two feet for both depth to bedrock and depth to groundwater, with the four-foot buffer being required for longer-term stacking sites.**

**Response:** Refer to our response to similar comments from the N.H. Sierra Club.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | Table 806-I Buffer Distances | **Clean Water #55w F,** |
| 10-15-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Much more care needs to be taken not to put sludge in locations where it could easily run off into neighboring surfacewaters, especially those used for drinking water, recreation, and shellfishing, Some recommendations:

Top dressing should not be allowed in the immediate watershed of these areas.

Applications should be limited in all cases to 8 percent grades.

The depth-to-groundwater limit for applications should be increased beyond the current 2 feet, and take into account recent variations, not just at the time sludge is to be spread.

Use of sludge for gravel pit reclamations should be banned.

The further setbacks from Rivers Management Act protected waterways enacted by the legislature doesn't appear to be incorporated in Table 806-I. Why not?

**Response:** Refer to our response to similar comments from the N.H. Sierra Club.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | Table 806-I Buffer Distances | **BFI #56w CJ,** |
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: The increased stringency of sludge quality and application standards makes more stringent buffer distances unnecessary. Although BFI Organics recognizes and supports setbacks proposed by the Department to eliminate off-site nuisance conditions (e.g., setback to roads and dwellings), BFI Organics requests that the Department reevaluate the non-nuisance condition setbacks (e.g., setbacks to wells, surface water) and use a scientific justification for their determination. BFI Organics is also concerned with footnote "g" and "f" which state "... as far as practical...". This requirement is too vague and open to interpretation.**

**Response:** Refer to our response to similar comments from the N.H. Sierra Club.

(s) The following ~~notes~~ shall apply to Table 806-I:

(1) ***The letter*** "a" means ***that*** the distance ***to surface waters*** may be reduced to 75 feet if the material is incorporated within 48 hours and the slope is less than 8 percent, *or the distance may be increased due to designated river classification.*

(2) ***The letter*** "b" means ***those*** community public water supply wells which withdraw greater than 57,600 gallons over a 24-hour period.

(3) ***The letter*** "c" means that the distance ***to property lines*** can be reduced through written agreement with affected party(ies).

(4) ***The letter*** "d" means ***that the*** distance ***to an off-site occupied dwelling*** can be reduced to 100 feet through written agreement with affected parties.

(5) ***The letter*** "e" means ***that this is the*** distance to the groundwater at ***the*** time of application of sludge.

(6) ***The letter*** "f" means ***that the distance to the nearest occupied dwelling shall be*** as far as practical beyond 500 feet, but can be reduced below 500 feet with the occupant's prior written consent.

(7) ***The letter*** "g" means ***that the distance to the nearest well shall be*** as far as practical, but in no case closer than 500 feet.

(8) ***The letter*** "h" means ***that the*** distance ***to groundwater*** can be reduced to 4 feet if the stockpile is covered and placed on an impervious surface with berms or other measures to prevent water from running on, off, or through the stockpile.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806 Irrational Restrictions | **MMSD #57w G,** |
| 10-21-98 | rfp | | | | |

**Comment:** Part 806 does not consider the relevant factors nor articulate a rational connection between the facts found and the choice to pile more restrictions on EQ Distribution and Marketing.

Part 807 applies the "statistically derived" *Best Available NH Biosolids Quality* numeric limits of 806,08(m)(or the more stringent home-state limits), (n)(99% of current NH POTW biosolids quality), and (o)(after 2001), to all Certificate application, and we fear to Milorganite®. If so, the rule arbitrarily and capriciously puts MMSD out-of-business in the state of NH. Milorganite® would thus be regulated exactly as if the MMSD treatment plants were in NH. Wisconsin biosolids quality was not included in the statistical data base used to derive the numeric limits, and can not fairly be extended beyond the boundaries of the "Live Free or Die" state.

As the Milorganite® "As Is" data indicates, Milorganite® meets the more stringent Best Available NH Biosolids Quality numeric limits of 806.08(m) & (n). only if monthly average is the arithmetic mean of all measurements taken during the month. If the maximum value of any grab is the legal enforcement limit, then Milorganite® could not be beneficially sold.

**Response:**

Env-Ws 806.09 Sludge Stockpiling.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09 Discouraging Beneficial SPF Use | **Simpson Paper Co #48w** |
| 10-7-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The proposed rules will require a substantial investment in any reclamation site in which short paper fiber is to be used. The cost for obtaining a groundwater permit, a hydrogeological survey, groundwater monitoring well, impermeable pads, and leachate collection will likely exceed $70,000 for each site. Our contractor currently utilizes 3-4 sites per year. Therefore, under the proposed rules, Simpson could expect to budget a minimum of $210,000 in new costs. Our existing program for all-in services is currently under $75,000, including trucking. If the rules are adopted as proposed, it will be more cost-effective to put Simpson's SPF in a landfill. It is my understanding that the NHDES encourages and supports a policy of beneficial use for wastewater residuals. The proposed rules will certainly discourage Simpson Paper Co. from continuing a successful recycling program in which landowners in NH have benefitted from the use of manufactured topsoil.

**Response:**

(a) Any person stockpiling sludge for longer than 2 days shall cover the stockpile with an odor control material, such as lime, wood ash which has been approved for such use pursuant to Env-Wm 3400, or cement kiln dust, to minimize odors.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(a) Stockpile Covering | **Monadnock #26w M,** |
| 9-10-98 | rfp | 9-16-98 | gcb | | |

**Comment:** Primary paper mill sludges typically have little nitrogen nor do they contain odorous putrescible waste, making the requirement of covering sludge with wood ash or cement kiln dust unnecessary.

**Response:** As it is possible for some primary papermill sludge to release odors, we will not modify this section.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(a) Non-Permeable Cover | **NHASH #54w O,** |
| 10-15-98 | rfp | 10-27-98 | gcb | | |

**Comment:** We question the use of non-permeable tarp to cover stockpiles of sludge, citing that keeping it in an air tight environment may make more of an odor problem, and vector problem. Our association also has issues with the notification process, as we commented on with the septage rules. We agree with the comments submitted by the NHWPCA.

**Response:** We have removed the requirement for a water repellent tarp as we also believe it could cause additional odors.

(b) Stockpiles of sludge shall be maintained ~~with material such as hay bales or native soil~~ to ~~prevent~~ ***minimize*** surface water run-on and run-off.

(c) Stockpiling of sludge shall not be permitted for greater than 48 hours on ~~a wellhead protection area or,~~ the 100-year flood plain as defined and delineated by the flood insurance rates maps published by the US ***D***epartment of ***H***ousing and ***U***rban ***D***evelopment or the ***F***ederal ***E***mergency ***M***anagement ***A***gency.

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| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(c) Wellhead Protection | **NHWPCA #29w U,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The size of areas encompassed by wellhead protection zones vary depending on the level of protection. The level of protection is not defined in these rules. According to DES personnel in the groundwater division, if all of the land encompassed by wellhead protection areas were restricted from stockpiling, there would be virtually no land available for sludge stockpiling in the southern third of New Hampshire. While water quality protection is certainly important in managing land application programs, reasonable set backs from wells along with stockpiling site criteria (maximum slopes, etc.) should be more than sufficient to minimize impacts to drinking water from sludge stockpiling. This time limitation for stockpiling in wellhead protection areas should be eliminated.

**Response:** We have revised the section to eliminate this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(c) Wellhead Protection | **BioGro #44w AO,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The areas encompassed by wellhead protection zones vary depending on the level of protection. It is inconsistent of the Department to permit the construction of septic systems which discharge nitrates and other nutrients on a daily basis in wellhead protection zones, yet not permit the temporary field stacking of biosolids and other organic residuals. It is important to develop and implement a sound stockpile management plan for these areas such as monitoring of the stockpile area, and appropriate site selection (slopes, run-on potential). **Therefore, the reference to limiting field stacking in these areas should be deleted.**

**Response:** We have revised this section to eliminate this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(c) Stockpile Limitations | **White Mnt. RMI #49w M,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Limiting to 48 hours the stockpiling of residuals in wellhead protection areas is unnecessary based on existing requirements for setbacks from wells. Land application of biosolids and other residuals is an agricultural practice, similar to manure spreading. Like biosolids, manure spreading and stockpiling in wellhead protection areas should adhere to best management practices. Beyond that, there is no need to further restrict stockpiling. According to some interpretations of the areas encompassed by wellhead protection zones, the entire southern third of New Hampshire would be restricted to 48 hour stockpiling of biosolids. This extra requirement is not scientifically justified and would eliminate the land application option for many of New Hampshire's municipalities and industries.

**Response:** We have revised this section to eliminate this requirement.

(d) Stockpiling of sludge shall not be permitted on any poorly or very poorly drained soils.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(d) Groundwater Buffer | **BFI #56w CK**, |
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: The buffer distances to groundwater specified in Table 806-I make this requirement unnecessary.**

**Proposed Language: Delete Env-Ws 806.09 (d).**

**Response:** Although we agree with you, we believe that it is a good idea to state this requirement.

(e) Stockpiling of sludge shall not be permitted on soils which have a permeability greater than 6 inches per hour in all layers within the upper 60 inches, ***unless the sludge is stockpiled on a pad with a permeability of at least 10*** $^{-6}$centimeters per second.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(e) Stockpile Pads | **BFI #56w CL**, |
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Stockpiling of sludge ~~shall not be~~will only be permitted on soils which have a permeability greater than 6 inches per hour in all layers within the upper 60 inches provided the sludge is stockpiled on a pad with a permeability of at least $10^{-5}$ centimeters per second.

**General Comment: Through the use of impervious pads, stockpiling should be allowed on soils with a permeability greater than 6 inches per hour in all layers within the upper 60 inches.**

**Response:**

~~(f) Stockpiles of sludge from a POTW remaining longer than 30 days shall be covered with a water repellent material, with berms, or with other measures sufficient to prevent water from running on, off, or through the stockpile.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(f) Unnecessary Confinement | **NHWPCA #29w V**, |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** With the stockpile time limits and siting requirements, there should be minimal impact from POTW stockpile storage at land application sites. Covering biosolids stockpiles can increase the odors emitted from biosolids when spreading, and berms around stockpiles can cause puddles and generally sloppy conditions. There should be no requirement to cover stockpiles of POTW sludge with water repellent material or berms.

**Response:** We have removed the requirement to cover the stockpiles with a water repellent cover.

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| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(f) Waterproof Covering | **BioGro #44w AP,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** It is neither possible nor an environmentally sound management practice to cover any manure. The Department has not fully defined what water repellent materials would be approved for this use. Should the Department require tarping, there is no way to maintain a tarp under field conditions. Furthermore, tarping any manure, including biosolids, will result in: (1) methane production; and (2) anaerobic composting conditions, which will generate odors and change the characteristics of the material.

Biosolids contain low levels of available nitrate. Mineralization must occur for nitrate to be produced and be available. This will not occur unless soil temperatures are sufficiently high enough to begin this process. Biosolids, even if anaerobically digested, can be covered with lime, which will aid in the forming of a crust which will in turn shed water. A more appropriate standard is that the biosolids stack in a shape to shed water. Therefore, we recommend the following:

**(f) Stockpiles of sludge from a POTW remaining longer than 90 days shall be shaped so as to shed water, and utilize berms or other measures as appropriate to divert up-slope stormwater run-off from the stockpile area.**

**Response:** We have deleted the requirement to cover stockpiles with a water repellent cover.

***(f) If any contaminant in sludge exceeds the NH S-1 soil standards in table 3 of the Contaminated Sites Risk Characterization and Management Policy dated January 1998, the sludge shall not be stockpiled unless engineered controls and/or management practices for the contaminant(s) have been submitted in the management plan and approved by the department to prevent risk to groundwater or human health.***

~~(g) Stockpiles of industrial sludge, including short paper fiber, remaining longer than 7 days, shall:~~

~~(1) Be placed on a pad with a permeability of at least $10^{-5}$;~~

~~(2) Provide for disposal of the pad after final use;~~

~~(3) Contain berms to collect any leachate; and~~

~~(4) Provide for collection and disposal of the leachate~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(g) Over Management | **Monadnock #26w N,** |
| 9-10-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Stockpiles of industrial sludge are over-managed using these pad, berm and leachate disposal requirements. Best Management Practices for paper mill sludge stockpiling have already been proposed by BFI Organics and accepted by the Waste Management Division during the Pelham Landfill closure process. These BMPs should be acceptable as they limit the height and size of the stockpile, facilitate pile run-off and eliminate heavy equipment activity on the piles.

**Response:** We have deleted this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(g) Reactive Restrictions | **NHWPCA #29w W**, |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** These requirements for industrial sludge stockpiling appear to be a response by the DES to volatile organic compound (VOC) detections around a massive stockpile of short paper fiber at a landfill closure project in southern New Hampshire. The VOCs detected in this case are generated during the decomposition of organic matter under anaerobic conditions. The impact at this one site would be expected at any site, with many types of organic matter (not just industrial sludges) given the same type of stockpile management. Adhering to good management practices and proper stockpile siting would address environmental concerns more effectively than requiring low permeability pads and leachate collection. As with the groundwater permit requirement, this stockpiling requirement would eliminate all but the largest industrial sludge recycling sites. In addition to paper mill residuals, this requirement would affect sludges from food processing, beer making or any sludge not produced by municipal wastewater treatment plants. NHWPCA recommends that the stockpiling of industrial sludge adhere to the following Best Management Practices:

Stockpiles will not exceed 12 feet in height.

Stockpiles will be shaped to facilitate surface water drainage

Stockpiles will not exceed 1000 cubic yards in volume.

Stockpiles will not be ramped or driven on by construction equipment

**Response:** We have deleted this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(g) Overburdensome | **BioGro #44w AQ**, |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Requiring concrete or other impermeable pads for the temporary field stacking of "industrial sludges" is inappropriate, costly and overburdensome. Industrial sludges are not limited to short paper fiber, but include a wide range of benign recyclable materials such as culled potato waste and fish waste. These materials are valued soil amendments and fertilizers, and because they do not contain human pathogens, are used directly in food crop production by a wide range of farmers, including many organic farmers. Farmers utilize their stacking sites by reseeding them. Farmers simply will not allow field space to be lost to concrete or hard pan clay pads throughout their farms.

**The management of field stacking sites for these materials require the same type of management practices as with POTW biosolids; therefore this section should be deleted.**

**Response:** We have deleted this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(g) Industrial Sludge Stockpiling | **White Mnt. RMI #4w N,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Industrial sludge, such as short paper fiber, generally has no domestic input, and consequently does not contain pathogens. Additionally, industrial sludges typically have lower metal concentrations than the already low levels found in New Hampshire biosolids. In general, the nutrient concentrations of industrial sludges are lower than those in biosolids. Stockpiling requirements should not be more restrictive for industrial sludges than for biosolids. The sludge quality certification (SQC) process will attest to the constituent quality of all residuals regulated under these rules. Stockpile best management practices and time limits will ensure that industrial sludge stockpiling does not adversely impact the environment. The use of impermeable pads and leachate collection should be eliminated for industrial sludges and replaced with a requirement to include best management practices.

Stockpiling Short Paper Fiber BMPs:

Stockpiles of short paper fiber shall not exceed 12 feet in height

Stockpiles of short paper fiber shall be shaped to facilitate surface water drainage

Stockpiles of short paper fiber shall not exceed 2,000 cubic yards

Stockpiles of short paper fiber shall not be ramped or driven on by construction equipment

**Response:** We have deleted this requirement.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09 Sludge Stockpiling | **AF & PA #51w M,** |
| 10-14-98 | rfp | 10-21-98 | gcb | | |

**Comment:** AF&PA believes that section Env-Ws 806 should be deleted in its entirety. The intent of this section can be dramatically clarified and simplified by referencing current Department guidance, or if deemed necessary, the joint EPA/USDA Guidance Document entitled "**Guide to Storage of Biosolids**." (A copy of the Guide can be obtained from Patricia Millner at USDA. Her E-mail address is pmillner@asrr.arsusda.gov). In the interim, should DES wish to develop or elaborate a set of BMPs specific to New Hampshire, the Guidance Document should serve as their basis. This document, which has taken close to three years to develop is based on a defined database of information which supports their recommendations. We strongly urge the Department to consider the principles in the **Guide**.

**Proposed Alternative Language**

The stockpiling of both domestic and non-domestic sludge(s) shall be performed in accordance with the following:
Stockpiles shall not exceed 12 feet in height;
Stockpiles shall be shaped to facilitate surface water drainage;
Stockpiles shall not exceed 2000 cubic yards; and
Stockpiles shall not be ramped or driven on by construction equipment.

**Explanatory Comments for Alternative Language**

AF&PA believes that §§806.09(a) through (g) can be simplified and clarified by consolidating them into one section.

(a) BMPs, rather than explicit requirements, make more sense to address the differences between various types of sludges and land application sites. For instance, it is inappropriate that a generator be limited to only 2 days without the use of an odor control material, when stockpiling paper mill sludge with a T. Nitrogen content of less than 1.5% in the month of March.

(no comments on paragraph (b))

(c) The 2-day storage period severely limits management options and locations without a scientific basis. The number of WPAs, particularly within the southern third of the State, is so extensive that it will preclude the stockpiling of solids altogether in that entire area. At the same time, this limitation implies that the minimum setback distances, established within Table 806-I, are insufficiently protective, thereby impugning the credibility of the established setback limits.

(d) & (e) AF&PA believes that these two paragraphs appear to be contradictory and ignore BMPs which could protect ground water – even on poorly drained or highly permeable soils. In addition, as with the 2-day limit, brings into question to setback distances. They also pose significant implementation problems. For instance, would the soils be tested within the upper 1 foot, lower foot (of 5' to 6') or somewhere in between? What ASTM test methods would DES require such that there is uniformity, to the extent practicable, on testing various

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 806.09(f), (g) Inequitable Treatment | **BFI #56w CM**, |
|---|---|---|---|---|---|
| 10-19-98 | rfp | 10-21-98 | gcb | | |

**Comment:** (f) Stockpiles of sludge ~~from a POTW remaining longer than 30 days shall be covered with a water repellent material, with berms, or with other measures sufficient to prevent water from running on, off, or through the stockpile.~~ whose volume exceeds 2000 cubic yards, where the stockpile will remain unprocessed or land applied for more than 7 days shall be:

(1) Covered with a water repellent material, or have other measures sufficient to prevent water from running on, off, or through the stockpile; or

(~~1~~2) Be placed on a pad with:

a. a permeability of at least $10^{-5}$ centimeters per second;
b. berms to collect any leachate; and
c. provisions for collection and disposal of the leachate.

~~(2) Provide for disposal of the pad after final use;~~

~~(3) Contain berms to collect any leachate; and~~

~~(4) Provide for collection and disposal of the leachate.~~

(g) ~~Stockpiles of industrial sludge, including short paper fiber, remaining longer than 7 days, shall:~~ The final disposition of the stockpile pad shall be addressed within the closure plan found in Env-Ws 808.09.

**General Comment: What's the scientific rationale for treating POTW sludge differently than industrial sludge (see 806.09(f) and (g))? Attached are ground water test results taken from a current industrial sludge stockpile and processing site which demonstrate that by limiting stockpile size and implementing appropriate proper stockpile management measures, these requirements are not necessary.**

**Response:**

Env-Ws 806.10 Testing.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10 SQC and Risk-Based Limits | White Mnt. RMI #49w Q, |
| 10-13-98 | rfp | | | | |

**Comment:** The analytical requirements necessary to receive sludge quality certification are excessive and unprecedented. The risk assessment performed to determine the risk-based concentrations for the federal biosolids regulations incorporated hundreds of peer-reviewed research papers and took over a decade to complete. The results of the USEPA risk assessment determined that only the concentrations of 10 trace metals in biosolids needed to be monitored to ensure public health and safety. Since the promulgation of the federal regulations it has been documented that the levels of potential pollutants are continuing to decline due to industrial pretreatment programs. Successful land application programs throughout the US have used the federal rules for guidance on biosolids analytical requirements without adversely impacting the environment.

The analytical requirements of the sludge quality certification program are not justified by science and will make land application cost prohibitive for many municipalities and industries. Additionally, the requirement for a generator to perform a risk assessment on a constituent of a residual, if standards are not already in place, is an unfair burden on wastewater treatment sludges. Many of the same constituents that are detected in biosolids at trace levels are also present in animal manures and other soil amendments. Fortunately, these compounds occur at very low concentrations and do not need further quantification for residuals that are applied at agronomic rates. RMI believes that initial sampling for constituents believed to be present (following the NPDES permit approach) would be a sufficient safeguard to prevent the land application of residuals with anomalously high concentrations of potential pollutants.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.09(g) Pad | **Tras Berg #58w A,** |
| 10-21-98 | rfp | | | | |

**Comment:** This pad lusiveness is nonsense. To lay a pad and leachate collection system is an excessive use of resources. The effort needed to dispose of and build such a pad will make the scale which most farmers utilize biosolids unfeasible.

**Response:**

~~Env-Ws806.06(1)(1)~~***(a)*** One soil test pit or auger boring ***shall be taken, at a depth of at least 40",*** for each soil mapping unit present on the natural resource conservation service county soils map, but no less than one every 5 acres~~; and~~.

~~Env-Ws806.06(1)(2)~~***(b)*** One soil test pit or auger boring ***shall be taken, at a depth of at least 6 feet,*** for each area proposed for stockpiling.

***(c) An analysis of the soil test pits or auger borings required in (a) and (b) above shall be performed and shall include a description of the soil profile characteristics, depth to seasonal high watertable, and depth to bedrock or other restrictive layer.***

(~~a~~***d***) Soil samples from ~~all~~ ***each*** fields proposed to be used for the land application of sludge, shall

be collected within 6 months prior to submittal of the permit application and within 3 months prior to the end of the permit term~~;~~.

***(e)*** ~~and~~ ***The soil samples in (d) above*** shall be analyzed by a laboratory certified ***to analyze water for metals,*** under Env-C 300 to analyze water for metal for the following constituents:

~~(1) Percent dry solids;~~

~~(2) pH, measured as SU;~~

(~~3~~*1*) Arsenic, measured as mg/kg;

(*42*) Cadmium, measured as mg/kg;

(~~5~~*3*) Chromium, measured as mg/kg;

(*64*) Copper, measured as mg/kg;

(~~7~~*5*) Lead, measured as mg/kg;

(~~8~~*6*) Mercury, measured as mg/kg;

(*97*) Molybdenum, measured as mg/kg;

(~~10~~*8*) Nickel, measured as mg/kg;

(~~11~~*9*) Selenium, measured as mg/kg; and

(12*0*) Zinc, measured as mg/kg.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(a) Background Metals | **Monadnock #26w O,** |
| 9-10-98 | rfp | 9-18-98 | gcb | | |

**Comment:** The metals concentration in background soil is likely to be negligible, as is the contribution from pulp and paper mill sludges suitable for land application. Both of these applications combined are unlikely to exceed the lifetime cumulative pollutant loading rate. Therefore the testing is unnecessary.

**Response:**

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| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(a) Testing | **AF & PA #51w N**, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA believes that DES should provide an incentive to generators to reduce contaminant levels by reducing the frequency of testing and reporting in certain circumstances. AF&PA recommends that if a facility or Generator can demonstrate that the sludge meets the 2001 "goals" over a specified period of time, as part of the annual monitoring requirement for sludge quality (pursuant to §807.05(c)) then the Generator will be exempt from performing the testing required by this section. AF&PA recommends the demonstration period be two consecutive testing periods each year.

**Should the Generator's Sludge Quality Certification records demonstrate continued compliance for two consecutive testing periods each year with the "goals" established within §806.08(p), the Generator is exempt from performing the soils testing required by this section.**

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(a) Field Testing Selection | **BFI#56w CN**, |
| 10-19-98 | rfp | | | | |

**Comment:** **General Comment: In light of this provision, the selection of fields for testing pursuant to 806.06(q) is unnecessary.**

**Response:**

(b*f*) ~~45 days prior to commencement of each land application event,s~~ *S*oil samples from ~~the~~ ***each*** fields used for sludge land application shall be collected on a yearly basis ***no more than 90 days prior to the initial application for that year*** and analyzed by UNH analytical services, or by a laboratory using a method that produces ~~comparable~~ ***similar*** , results to those produced by UNH analytical services, for:

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(b) Testing | **AF & PA #51w O**, |
| 10-14-98 | rfp | 10-21-98 | gcb | | |

**Comment:** AF&PA believes that the time period of 45 days prior to commencement should be increased to 90 days in order to provide the Site operator additional time to more effectively plan for the application of sludge at each site. Furthermore, the words "each" and "on a yearly basis" should be deleted as they imply that sludge will be applied only once annually, which may not always be the case.

**Proposed Alternative Language**

(b) **90 days** prior to commencement **of land** application, soil samples from the fields used for sludge land application shall be collected **annually for each year the site is used** and analyzed by UNH analytical services, or by a laboratory using a method that produces comparable results to those produced by UNH analytical services, for:

**Response:** We have revised this section to incorporate your comments.

(1) Soil acidity, measured as pH;

(2) Buffer pH;

(3) Texture;

(4) Calcium;

(5) Magnesium;

(6) Potassium;

(7) Phosphorus; and

(8) Organic matter;.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(b) Soil Sample Timing | **NHWPCA #29w X**, |
| 9-23-98 | rfp | | | | |

**Comment:** Soil samples help to determine application rates for organic residuals. In order to plan deliveries to a field, the soil sample should be taken well in advance of delivery. 45 days prior to delivery is too short of a period for land application planning purposes. In order to meet the intent of this section, that soil chemistry is not significantly changed between the time of soil sampling and land application, this requirement should state that soil samples will be taken after the last application of fertilizer or after the last removal of crops, whichever is more recent, before land application. Additionally, soil tests should only be required prior to land application events, not yearly.

**Response:** We have increased the time to 90 days.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(b) Soil Sample Timing | **BioGro #44w AR**, **NHASH #54w P**, |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** If it is a good spring, we currently have farms that are ready for planting on April 15. As written, we would need to take the soil sample 45 days before, which would be in February, and field conditions (I. e., snow and frozen ground) do not permit this to be completed.

It is standard agronomic practice to take soil samples in the fall for spring applications so that: (a) appropriate purchases can be made, and (b) you are not holding a farmer from beginning his planting because we are waiting on the lab. **Therefore, the reference to 45 days should be deleted from this section.**

**Response:** We have increased the time to 90 days.

~~(c) Each mixture of sludge to be land applied shall be analyzed annually within 45 days prior to land application for the parameters listed in (a) and (b) above.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(c) Excessive Testing | **Monadnock #26w P**, |
| 9-10-98 | rfp | 9-16-98 | gcb | | |

**Comment:** This testing is excessive and should be eliminated considering the requirements for obtaining a SQC and the frequency of monitoring during a year.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(c) "mixture of sludge" | **NHWPCA #29w Y**, |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** "mixture of sludge" is not defined. It is not clear to which materials this section applies. Regardless of the definition of a mixture of sludge, with the exception of texture, soil acidity, buffer pH and organic matter, the parameters in this section will be analyzed for in biosolids under sludge quality certification requirements. The parameters listed here that are not included in SQC testing are relevant soil parameters, but should not be required analytes for sludge that is land applied.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.10(c) Testing | **AF & PA #51w P,** |
| 10-14-98 | rfp | | | | |

**Comment:** This section is a duplicate of requirements found in Section 807, Sludge Quality Certification: 1) §807.05© [metals], whose frequency for monitoring is dependent on the quantity of sludge produced, but at the very minimum is annually, and 2) §807.05(d), (a) and (b) [for all other classes of analytes]. At present, it appears that the Department had intended annual frequency for monitoring, as a minimum. Thus, since annual monitoring of the sludge is already required, AF&PA recommends that §806.10(c) be deleted.

**Response:**

Env-Ws 806.11 Recordkeeping.

(a) Every site permit holder shall maintain records of each load of sludge received at the site, including identification of:

(1) The date received;

(2) The ***name of the*** hauler delivering the load;

(3) The ***generator and*** quantity of each load of sludge received, ~~by generator~~ in ~~dry~~***wet*** tons, and percent solids;

(4) The sludge quality certification number***(s)***; and

(5) The ~~disposition of the material~~ ***date land applied***.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.11(a)(3) Generator Tracking | **Monadnock #26w AE,** |
| 9-21-98 | rfp | 10-19-98 | gcb | | |

**Comment:** We believe this line refers to a requirement to track back specific loads to particular generators. This line is confusing and we recommend that (a)(3)should delete "by generator" and new (a)(4) should state"The generator of each load."

**Response:** We have revised this section to incorporate your comments.

(b) ***Except for sites where only sludge certified as low metals sludge is applied,*** every site permit holder shall maintain records of the annual and cumulative metal loadings for the site on a field by field basis. In the calculation of annual metals loadings, the permit holder shall use the highest concentration of each metal observed on a dry weight basis, based on testing performed by the generator(s) during the previous 12 months.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.11 (b) Metal Loading Calc. | **NHWPCA #29w Z,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Annual metal loading calculations should be based on average metal concentrations instead of the highest metal concentrations. The use of average metal concentrations would give a better representation of the actual metal loading for individual sites.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.11(b) Loading Calculations | **BioGro #44w AS,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** It is inappropriate and inaccurate to calculate the metals loadings based upon the highest concentration of each metal observed on a dry weight basis for the previous 12 months. The more accurate calculation is based upon averages. Many landowners review the annual metals loading for the micronutrients (copper, zinc, etc.) to determine if additional supplements are needed. A calculation based upon the highest detection (which is unlikely to accurately reflect the on-going quality of the material), would result in deficiencies, as the farmer prepares the calculations for the micronutrient supplements. Therefore, this section should be revised as follows:

**(b) Every site permit holder shall maintain records of the annual and cumulative metal loadings for the site on a field by field basis. In calculating annual metal loadings, the permit holders shall use the average concentration of each metal observed on a dry weight basis, based upon testing performed by the generator(s) during the previous 12 months.**

**Response:**

(c) Site plans, management plans, and records shall be maintained by the permit holder , and

shall be available to ***the*** department ~~personnel~~ for review during business hours. If the department believes that violations of RSA 485-A or these rules~~;~~ relative to sludge management have occurred, the department shall require the permit holder~~;~~ to submit copies of all records.

(d) Site plans, management plans, and records shall be maintained for a minimum of ~~3~~***5*** years after cessation of the of the activity to which they relate.

(e) Records relating to site permits shall be maintained for a minimum of ~~3~~***5*** years after expiration of the site permit.

Env-Ws 806.12 Reporting.

(a) At least 14 days prior to commencement of each yearly sludge land application activity, the permit holder shall submit the following information to the department for each site:

(1) The site name and address;

(2) The name of permit holder;

(3) The sludge quality certification numbers ***of the sludge(s) to be land applied***;

(4) The permit number ***for the site***;

(5) A copy of UNH cooperative extension's recommendation(s);

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.12(a)(5) UNH Recommendations | **BioGro #44w AT**, |
| 10-5-98 | rfp | | | | |

**Comment:** This provision mandates that UNH review each permit application and agronomic supporting documents and provide a field by field nutrient recommendation which is inappropriate, vague and is open to arbitrary and capricious decisions.

UNH Cooperative Extension does not have the official mandate or authority to conduct a review of each permit on a yearly basis. This procedure is contrary to standard agricultural practice. Nutrient recommendations based upon crop yield are developed and published for use by farmers and other agricultural advisors. There is no scientific or technical justification to require a landowner to obtain a separate recommendation simply because biosolids are being used. If a farmer is planting corn, the initial crop recommendation is 7 - 8 pounds of nitrogen for each ton/acre. All of the crediting for residuals is being done by the generator when the rates are calculated each year. Therefore, this section should be deleted, as crop recommendations can be obtained by the permit holder by their agricultural advisors and provided to the Department with the application rate calculations.

**Response:** We will continue to use UNH Cooperative Extension's recommendations.

(6) The current soils nutrient analysis pursuant to Env-Ws 806.10(~~b~~*f*) for each field; and

(7) The agronomic rate calculations for each field based on UNH cooperative extension's nutrient recommendations for the sludge or sludge mixture that is proposed to be land applied that year for each field.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.12(a)(7) UNH Authority | **BioGro #44w AU**, |
| 10-5-98 | rfp | | | | |

**Comment:** This section is confusing and, as stated in the comment above, is unnecessary. As written, this provision would transfer the permit review authority of the Department to UNH Cooperative Extension, which is against the mandate and authority of Cooperative Extension. **Therefore, this language should be revised as follows:**

**(7) The agronomic rate calculations for each field, based upon the nutrient value for the sludge or sludge mixture that is proposed to be land applied.**

**Response:** This section does not transfer DES's authority to UNH Cooperative Extension. It still remains a DES decision on whether or not to accept their recommendations.

(b) Every site permit holder shall submit an annual report for each site to the department by the last business day of January for each calendar year in which the permit is valid, regardless of whether or not the site received or processed sludge during the previous calendar year.

(c) The annual report shall contain the following information:

(1) The site location, ***including*** address and town;

(2) The permit number;

(3) The owner's name;

(4) ~~Any~~ ***The*** crops grown for each field and the crop disposition;

(5) The name and sludge quality certification number, ***if applicable,*** of each generator;

(6) The quantity of sludge, in ***wet and*** dry tons, applied to each field, from each generator;

(7) The total quantity of sludge, in ***wet and*** dry tons, applied to the entire site, from each generator;

(8) ***Except for sites where only sludge certified as low metals sludge,*** the annual metals' loading and cumulative metals' loading to date; and

(9) ~~The results of analyses conducted in accordance with Env-Ws 806.10(c).~~***For reclamation sites, the groundwater monitoring report.***

~~(d) The permit holder shall submit the annual fee, as specified in Env-Ws 806.04, with the annual report.~~

(e***d***) If any of the information differs from that previously supplied to the department concerning the activity, the permit holder shall note those differences in the annual report.

~~(f) If any required annual report or annual fee is not submitted to the department by the last business day in January, the department shall proceed in accordance with Env-Ws 804.05 to suspend or revoke the permit.~~

**PART Env-Ws 807 SLUDGE QUALITY CERTIFICATION REQUIREMENTS**

Env-Ws 807.01 Sludge Quality Certification Application. To apply for the sludge quality certification, the generator shall provide the following information:

(a) The name and address of the wastewater treatment facility or facility which has generated or will generate the sludge ~~or sludge-derived product~~;

(b) The name, title, and telephone number of the operator of the treatment facility;

(c) For POTWs, a ***list and brief*** description of all industrial ~~pretreatment~~ permittees and the permittee's limits, ~~if applicable~~ ***including a table containing the estimated quantity and physical and chemical characteristics of each discharge and the specific concentration limits in the permit for parameters reasonably expected to be present, being the information required to be maintained by POTWs for industrial discharges under Env-Ws 405.04(c)***;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.01 SQC information | **Citizens**, |
| 8-20/9-25-98 | mwr/rfp | 10-15-98 | pmc | | |

**Comment:** Generators should be required to supply a list of all industrial wastewater contributors and the constituents of their wastewater as required in the present regulations. The draft regulations only require a list of pretreatment permittees and their permit limits. Ordinary EPA testing methods for VOCs and SVOCs of highly contaminated sludge yield such high RDLs that important pollutants are not being picked up.

**Response:** Revised the rule to require submission of a table of all industrial permittees and the constituents of their wastewater.

(d) For industrial wastewater treatment facilities, the name~~, material safety data sheets,~~ and quantity of all chemicals being discharged to their treatment facilities. ***A copy of the most recent NPDES permit application with a statement that the information is current will satisfy this requirement***;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.01 MSDS sheets | **Ciccone C**, **Monadnock Q** |
| 8-25 / 9-10-89 | mwr / rfp | 10-15-98 | pmc | | |

**Comment:** There is no demonstrable need for MSDSs. The industrial facility should be able to use a reference list, such as that provided under the NPDES program, and test for chemicals expected to be present. It is not practicable for the Department to review all MSDSs from participating facilities. DES staff, though capable, cannot possibly review hundreds of chemical sheets and determine what the composition of the sludge will be. Sludge composition can only be determined from the sludge's analysis. However, testing for chemicals "expected to be present", as presented under the NPDES program and described under 807.05 (b) below, is appropriate.

In addition, we question why POTWs are exempted from the requirement to provide MSDSs to the Department. POTWs must obtain the same information from their contributing industries, if the rule is to be applied consistently.

**Response:** Deleted the requirement for MSDS sheet submission, added a provision for NPDES permit application submission to provide required information

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.01 (d) MSDS | **NHWPCA AA**, |
| 9-23-98 | rfp | | | | |

Comment: The requirements for sludge quality certification include a very thorough chemical characterization of the sludge to be recycled. Because the sludge resulting from wastewater treatment is the product to be recycled, chemical characterization of the sludge should be the criteria for review for land application projects. Submission of material safety data sheets would result in an extraordinary increase in paperwork and regulatory review with no obvious benefit. This requirement should be eliminated.

**Response:** Deleted the requirement for MSDS sheet submission, added a provision for NPDES permit application submission to provide required information

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.01(c) & (d) IPP Report Submittal | MMSD F, |
| 10-21-98 | rfp | | | | |

**Comment:** In response to Part 807.01(c), MMSD could submit Chapter 11, MMSD Rules for the Pretreatment Program which contains the local pretreatment limits applicable to all users of the system; and the Annual Pretreatment Effectiveness Analysis submitted to the Wisconsin Department of Natural Resources which contains the Significant Industrial Users and the EPA Categorical standards applicable to the SIUs. While this is all available public information, what governmental purpose could it pursued by DES based on the data?

In response to Part 807.01(d), the MMSD would be unable to gather the information required of "industrial wastewater treatment facilities" as defined in Part 802.13 to mean all non-domestic users. We have no reason to review or retain the Material Safety Data Sheets and Quantity data for "all chemicals" discharged by non-domestic users of the sewerage system.

Part 807.01© &(d) should be revised to clarify the "either or" nature of he non-domestic chemical reporting burden when applying for SQC or the Part 802.13 definition should be clarified so as not to include industrial wastewater discharged to a POTW system and commingled with domestic wastewater.

**Response:**

(e) The quantity of sludge ~~or sludge-derived product~~, in ~~dry~~ ***wet*** tons, generated monthly by the treatment facility for the last 2 years;

(f) ~~The discharge monitoring reports from the treatment facility for the last 2 years~~ ***If the sludge is not generated in New Hampshire, certification that the sludge meets the chemical standards for land application in the state of origin;***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.01(f) DMRs | **Monadnock R, NHWPCA AB,** |
| 9-10 / 9-23-98 | rfp/ rfp | 9-15-98<br>10-15-98 | gcb<br>pmc | | |

**Comment:** The Department already has discharge monitoring reports from the treatment facility and should not require the WWTF to re-submit them to the same *Bureau* twice. In addition, as noted in 807.01(d), above, sludge quality should be determined by the sludges' analysis, not by what is discharged from the treatment facility. Various methods of treatment applied after sludge is removed from the process, will potentially change wastewater characteristics from intermediate to final waste streams, resulting in an inaccurate portrayal of sludge characteristics. There is no need for discharge monitoring reports to be submitted. Effluent quality is not indicative of sludge quality and the parameters covered in the discharge monitoring reports do not overlap with those required to be tested for in sludges under this chapter.

**Response:** Deleted the requirement to submit DMRs

(g) ***If the sludge contains human waste~~A~~a,*** description of the process to achieve class A or class B pathogen reduction requirements and vector attraction reduction requirements, including the applicable 40 CFR part 503 citation~~, if applicable; and~~

( h) ~~The results of the analyses required in Env-Ws 807.05(a).~~ ***A sludge quality report which includes the following:***

***(1) A description of the treatment facility and sludge treatment process;***

***(2) A chronological summary of analytical data from the previous 3 years, if available, for each detected chemical, presented in tabular form. Data shall be presented categorically for metals, volatile organic compounds, semi-volatile organic compounds, dioxins, and pesticides/herbicides and compared with the applicable chemical standards contained in these rules;*** and

***(3) The results of testing required in Env-Ws 807.05(d),including laboratory reports, presented categorically as in (a)(3) above; and***

***(I) Lab reports for all analyses required under Env-Ws 807.05(d).***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05(a)(2) Specific Contaminants | **Monadnock T.** |
| 9-10-98 | rfp | 9-18-98 | gcb | | |

**Comment:** Does the "specific contaminants of concern" include any parameter outside the required testing? DES should clarify this statement.

**Response:**. The reference to "specific contaminants of concern" has been deleted.

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| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Suggested Wording | **Monadnock AF,** |
| 9-21-98 | rfp | | | | |

**Comment:** (a) Upon submittal of an application for sludge quality certification, the applicant shall submit a sludge quality report to the department which includes the following:

(1) A description of the treatment facility and sludge treatment process and a brief history of the facility and overall description of sludge quality.

(2) A description of the possible uses of the material and its overall benefit.

(3) A chronological summary of the data from the previous 3 years, if available, for each detected chemical presented in tabular form. Data should be presented categorically for metals, priority pollutants, volatile organic compounds, semi-volatile organic compounds, pesticides/herbicides and compared with the chemical standards contained in these rules.

(4) A narrative comparison of the detected chemicals to the chemical standards .

(5) The results of testing required in Env-Ws 807.05(b), presented categorically as in (a)(3) above.

(6) Specific conclusions on whether the sludge meets the requirements for sludge quality certification and recommendations for the future sampling plan.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (a) Excessive Requirement | **NHWPCA AC,** |
| 9-23-98 | rfp | | | | |

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**Comment:** The current requirements in this section are excessive and unnecessary for determining sludge quality. Graphical depictions of each compound to establish trends over time are unnecessary unless a sludge has a particular problem (exceedances of the standards) with a specific compound. Narrative comments on individual compounds should be confined to those which have exceeded the standards at some point during sludge analysis. In order for the DES to receive objective and sludge analysis from applicants, NHWPCA recommends that this section reads as follows:

*Upon submitting an application for sludge quality certification, the applicant shall submit a sludge quality report to the department that includes the following information:*

*A description of the treatment facility and sludge treatment process and a brief history of the facility and a description of sludge quality.*

*A chronological summary of the data from the previous 3 years, if available, for each detected chemical presented in tabular form. Data should be presented categorically for metals, priority pollutants, volatile organic compounds, semi-volatile organic compounds, pesticides and compared with the chemical standards contained in these rules. Include a narrative description of testing results.*

*same as the original (4)*

*same as the original (5)*

*same as the original (6)*

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (a) Testing | AF & PA Q, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA believes that these sections are confusing and can be clarified and simplified by consolidating them into one.

**Proposed Alternative Language**

(a) The application for sludge quality certification shall include a sludge quality report which **includes the following:**

(1) A description of the **waste water** treatment facility and sludge treatment process and a brief history of the facility and overall **description of** sludge quality.

**(2) Data from the previous 3 years, if available, for each chemical found above the detection limit, presented in tabular form. Data should be categorized for metals, priority pollutants, volatile organic compounds, semi-volatile organic compounds, pesticides and compared to the State's Ambient Ground Water Quality Standards, accompanied by a narrative description and overall summary of the results.**

**(3)** The results of testing required in Env-Ws 807.05(b). These results must be presented in a table which also includes a comparison to the State's Ambient Ground Water Quality Standards

**(4)** Specific conclusions on whether the sludge meets the requirements for sludge quality certification and recommendations for the future sampling plan.

**(5)** Copies of the laboratory data sheets for all testing described in the report **shall be retained by the Generator for the life of the Permit and made available to the Department upon request.**

**Response:**

Env-Ws 807.02 Sludge Quality Certification ~~Application~~ Fees.

(a) Each application shall be submitted in duplicate and shall be accompanied by a fee in the amount of $1,000.

(b) Fees ~~shall be in the form of a~~, ***if paid by*** check or money order, ***shall be made*** payable to "Treasurer-State of NH".

(c) Municipalities whose facilities are permitted by the department under RSA 485-A:13 shall be exempt from the fee specified ***in (a)*** above.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 807.02© Unfair Fees | BiogroAB AV, |
|---|---|---|---|---|---|
| 10-5-98 | rfp | | | | |

**Comment:** As stated in earlier comments, it is unfair, discriminatory and unconstitutional to require only one segment of the regulated community to pay the costs of administering the program. **Therefore, this section should be deleted.**

**Response:** Exemption of municipalities from fees is required to comply with RSA 541-A:25 which prohibits unfunded mandates by rule

Env-Ws 807.03 Criteria for Review. The department shall issue a sludge quality certification to the wastewater treatment facility generating the sludge or the facility ~~producing a~~ ***processing or treating sludge,*** ~~derived product~~ if it determines that the information submitted demonstrates that the sludge:

(a) Is not a hazardous waste as defined in RSA 147-A:2,VII;

(b) ***If derived from human waste,*** consistently meets the pathogen and vector attraction requirements specified in the application; ~~and~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.03(b) Pathogen & Vector Requirements | **Monadnock S,** |
| 9-10-98 | rfp | 9-16-98 | gcb | | |

**Comment:** Again, pathogen and vector attraction reduction requirements are not applicable to industrial sludges, such as paper mill sludges, which do not contain pathogens (i.e. human waste).

**Response:** Revised rule to specify pathogen/vector attraction reduction only for sludge containing human waste

(c) ~~Meets the additional criteria specified in Env-Ws 807.05(c).~~ ***Does not exceed the following concentrations, expressed as the total concentration on a dry weight basis:***

***(1) For arsenic, 32 mg/kg;***

***(2) For cadmium, 14 mg/kg;***

***(3) For chromium, 1000 mg/kg;***

***(4) For copper, 1500 mg/kg;***

***(5) For lead, 300 mg/kg;***

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*(6) For mercury, 10 mg/kg;*

*(7) For molybdenum, 35 mg/kg;*

*(8) For nickel, 200 mg/kg;*

*(9) For selenium, 28 mg/kg;*

*(10) For zinc, 2500 mg/kg;*

*(11) For polychlorinated biphenyls (PCB), 1.0 mg/kg; and*

*(12) For dibenzodioxins and dibenzofurans, 10 ng/kg TEQ for 2,3,7,8 TCDD and 2,3,7,8 TCDF; and 27 ng/kg for all congeners determined by EPA method 1613 using the 1989 toxic equivalency factors.*;

*(d) Is of sufficiently consistent quality such that for the constituents in (c) above, the mean concentration for data submitted under Env-Ws 807.01 (h) plus one standard deviation from the mean does not exceed 1.5 times the concentration specified in (c) above;*

*(e) Is not a threat to public health, safety, or the environment from other chemical contaminants when assessed according to risk methodologies established in the department's Contaminated Site Risk Characterization and Management Policy, dated January 1998 or equal;*

*(f) If not generated in New Hampshire, meets the chemical standards the state of origin; and*

*(g) If the sludge is to be certified for reclamation use, contains enteric virus concentrations of less than 1 plaque-forming unit per 4 grams of solid on a dry weight basis. Class A sludges are deemed to have meet this standard.*

*(h) If the sludge is to be certified as a low-metals sludge, does not exceed the following concentrations, expressed as the total concentration on a dry weight basis:*

*(1) For arsenic, 10 mg/kg;*

*(2) For cadmium, 10 mg/kg;*

*(3) For chromium, 160 mg/kg;*

*(4) For copper, 1000 mg/kg;*

*(5) For lead, 270 mg/kg;*

*(6) For mercury, 7 mg/kg;*

*(7) For molybdenum, 18 mg/kg;*

*(8) For nickel, 98 mg/kg;*

*(9) For selenium, 18 mg/kg;*

*(10) For zinc, 1780 mg/kg;*

Env-Ws 807.04 Expiration of Sludge Quality Certification. ~~Sludge quality certifications shall expire five years from the date of issuance.~~

*(a) Subject to (b) below, sludge quality certifications shall expire five years from the date of issuance.*

*(b) For all generators in possession of an existing sludge quality certification, such certification shall expire one year from the effective date of 1999 amendments to Env-Ws 800.*

*(c) Generators of class A sludge shall*

*(1) Within one year of the adoption of the 1999 amendments to the Septage and Sludge Management Rules, obtain a sludge quality certification; and*

*(2) Upon adoption, comply with the requirements of Env-Ws 807.03 (c) , Env-Ws 807.03 (e), Env-Ws 807.05(e), Env-Ws 807.05(f),Env-Ws 807.06, and Env-Ws 807.07.*

Env-Ws 807.05 Testing.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | Priority Pollutants | **Wheelabrator / Bio Gro C** |
| 9-4-98 | rfp | 10-15-98 | pmc | | |

**Comment:** New Hampshire should retain its current language and reliance upon the pollutant concentrations limits, ceiling concentration values, and cumulative pollutant loading limits for priority pollutants as stated in the EPA 503 regulations.

**Response:** See general comment responses

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | Priority Pollutant Testing Costs | **Plymouth W & S Dist. C** |
| 9-4-98 | rfp | 9-16-98 | gcb | | |

**Comment:** The cost of testing our biosolids to verify all the parameters cited are excessive for a small community such as ours.

**Response:** Testing is essential because it is the sole basis for determination of suitability for land application

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Facility-Specific Limits | **Mass WRA C,** |
| 10-7-98 | rfp | | | | |

**Comment:** We find problematic, the vague discretion of the Department to develop a facility-specific limit for any constituent detected from the extensive testing in 807.05 required for sludge quality certification. With current laboratory detection abilities, many sewage sludges will be found to contain at least some of these constituents in trace amounts. Few generators could be assured that despite good faith submission of the voluminous quantity of data these regulations require, they could expect to receive sludge quality certification in a timely fashion, particularly if the Department chooses to exercise its prerogative to develop facility-specific standards. This provision also raises questions of fairness in that different facilities may be required to meet different standards. On what factors would such differences be based?

**Response:**

~~(a) Upon submitting an application for sludge quality certification, the applicant shall submit a sludge quality report to the department which includes all data on testing of the sludge generated from the treatment facility or facility for, if available, at least the previous 3 years.~~

~~*(b)* This report shall contain as a minimum~~:

~~(1) A description of the treatment facility and sludge treatment process and a brief history of the facility and overall trends in sludge quality.~~

~~(2) A narrative description of all the testing results including a description of any specific contaminants of concern based on a comparison of the testing results with the chemical standards contained in these rules.~~

~~(3) A chronological summary of the data from at least the previous 3 years for each detected chemical:~~

~~*a.* presented both in tabular form and graphically to establish trends in sludge~~

~~quality for each compound and a comparison with existing department standards.~~

~~*b.* Data should be presented categorically for metals, priority pollutants, volatile organic compounds, semi-volatile organic compounds, pesticides and compared with the chemical standards contained in these rules.~~

~~c. Statistical analysis including averages, ranges, standard deviations, and indicators of long term trends in sludge quality should also be presented.~~

~~(4) The results of testing required in Env-Ws 807.05(b). These results must be presented in a table which also includes the chemical standards contained in these rules.~~

~~(5) Specific conclusions on whether the sludge meets the requirements for sludge quality certification and recommendations for the future sampling plan.~~

~~(6) Copies of the laboratory data sheets for all testing described in the report.~~

(~~b~~*a*) ***Subject to (b) below, u***pon submitting an application for a sludge quality certification, the applicant shall submit the results of ~~an~~ ***the*** analyses of at least ~~3~~ ***4*** representative samples of sludge from the treatment facility or facility, taken at least 60 days apart within the 12 months prior to the date of application ~~for the following compounds~~.

***(b) For batch processes or finite quantities of sludge proposed for land application, a representative composite sample(s) from each batch or finite quantity can be collected on a one time basis according to the procedures in "An Addendum To The POTW Sludge Sampling And Analysis Guidance Document: Sludge Surface Disposal Sampling", dated May 1992.***

(~~d~~*c*) All samples shall be collected in accordance with the procedures described in ***" POTW Sludge Sampling And Analysis Guidance Document"*** by the United States Environmental Protection Agency, dated August 1989 or equal ~~Such analyses shall include a separate list of all compounds detected and the concentration of each in mg/kg~~.

***(d) Sludges collected according to (a) or (b) above shall be analyzed for the following constituents:***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Sludge testing | **Citizens**, **Sayen** ,**Saffo A** |
| 8-20/9-25-98 | mwr/rfp | | | | |

**Comment:** The proposed requirements for sludge quality certification and sludge testing are not adequate and will continue to allow hazardous waste and sludges of questionable quality to be land applied in New Hampshire. The testing requirements in terms of scope and frequency are not sufficient to completely characterize the quality of sludges. Assuming monitoring was adequate, the rules allow the averaging of analytical results ensure that noncompliant, poor quality sludges can still be land applied. Batch testing would be more appropriate and protective.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (b) VOC Testing | **BIA D** |
| 9-8-98 | rfp | | | | |

**Comment:** Additional volatile organic compound testing in the proposed rules is an overreaction to an isolated incident involving the stockpiling of large amounts of sludge in connection with the capping of a landfill in Pelham.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05(b) Testing | **Monadnock W** |
| 9-10-98 | rfp | | | | |

**Comment:** The Environmental Protection Agency has suspended the requirement for certain testing (Tables II & III) and reporting under 40 CFR 122.21 (g)(7)(ii)(A) for certain industrial categories and required identification only of chemicals in Tables IV and V, if they are expected to be present in the NPDES discharge. Since the Department has already specified testing related to NPDES requirements under Section (a), perhaps the information and data already developed within NPDES applications could be relied upon rather than requiring thousands of dollars in additional testing. The Department has already concluded that Discharge Monitoring Reports, the result of permit development based on the Tables, are a valid source of information by their requirement in 807.01(f) above. Though we don't believe the effluent testing bears on sludge quality, the mechanism of identifying that which is 'expected to be present" is reasonable.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05(b) Additional Testing | BiogroAB AW, |
| 10-5-98 | rfp | | | | |

**Comment:** This additional testing requirement is overly burdensome, costly and unnecessary. The U. S. EPA and state agencies already review a treatment plant's processes, pretreatment programs and inputs, as well as their biosolids management plan when issuing the NPDES permit. Testing frequencies and parameters are established based upon this information as well as the treatment plant's processing capabilities. It is unnecessary to require a generator already testing on a regular basis for these parameters (for example: quarterly) to undertake an additional 3 samples in 6 months prior to submitting an application for a sludge quality certificate. This represents significant increased cost to municipalities and generators who want to participate in a recycling program. The cost for one dioxin test alone is over $1,500. **Therefore, the total cost for testing just for dioxin would be $4,500.**

The Department, with the support of wastewater treatment plant operators, sought and obtained legislation to fund random testing of biosolids to verify that the NPDES testing frequency was an accurate measure of biosolids quality. This program has provided a cost-effective mechanism for obtaining data. To date, none of the random sampling has identified a biosolid that would require testing beyond its NPDES requirements. **Therefore, we recommend the following:**

**(b) Upon submitting an application for a sludge quality certification, the applicant shall submit the results of at least 3 analyses from the treatment facility from the past 12 months for the compounds listed below. If the generator is not currently required under its NPDES permit to test for any of the parameters below, it shall submit the additional 3 analyses for those compounds taken within the last 6 months from the date of the application. Testing for toxic equivalency for dioxin shall be conducted annually. All samples shall be collected in accordance with the procedures described in Sludge Sampling and Analysis Evidence, by the U. S. EPA, dated August 1989. Such analyses shall include a separate list of all compounds detected and the concentration of each in mg/kg.**

**Response:**

(1) ~~The priority pollutants listed in Table II and Table III of 40 CFR Part 122, Appendix D and~~ ***The metals in Table 807-I(a), analyzed*** ~~performed~~ in accordance with the methods in "Test Methods for Evaluating ~~Soil~~***Solid*** Waste", Volume b, Laboratory Manual, Physical /Chemical Methods, identified as EPA SW846, dated November 1986; . ***Detection limits shall be below the regulatory limits specified in Env-Ws 807.03(c);***

***Table 807-I***

| | | |
|---|---|---|
| | *(a) Metals* | |
| ***Arsenic*** | ***Cadmium*** | ***Chromium*** |
| ***Copper*** | ***Lead*** | ***Mercury*** |
| ***Molybdenum*** | ***Nickel*** | ***Selenium*** |
| ***Zinc*** | ***Antimony*** | ***Beryllium*** |

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| | | |
|---|---|---|
| ***Silver*** | ***Thallium*** | |
| | ***(b) Pesticides and Polychlorinated Biphenyls*** | |
| ***Aldrin*** | ***Gamma-BHC*** | ***Alpha-BHC*** |
| ***Delta-BHC*** | ***Beta-BHC*** | ***Chlordane*** |
| ***4,4'-DDT*** | ***4,4'-DDE*** | ***4,4'-DDD*** |
| ***Alpha-Endosulfan*** | ***Beta-Endosulfan*** | ***Endosulfan Sulfate*** |
| ***Endrin*** | ***Endrin Aldehyde*** | ***Heptachlor*** |
| ***Heptachlor Epoxide*** | ***Toxaphene*** | ***2,4 Dichlorophenoxy Acetic Acid*** |
| ***PCB-1242*** | ***PCB-1254*** | ***PCB-1221*** |
| ***PCB-1232*** | ***PCB-1248*** | ***PCB-1260*** |
| ***PCB-1016*** | | |
| | ***(c)Additional Analyses*** | |
| ***pH*** | ***Percent nitrate-nitrite*** | ***Percent potassium*** |
| ***Percent dry solids*** | ***Percent total Kjeldahl*** | ***Percent phosphorus*** |
| ***Percent ammonia nitrogen*** | ***Percent organic nitrogen*** | ***Percent organic matter*** |

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Cyanide | **Shields C,** |
| 8-26/9-28-98 | mwr/rfp | 10-30-98 | mwr | | |

**Comment:** Cyanides in sludge should be regulated. Cyanide should be added to the list of compounds for which analysis must be performed to receive sludge quality certification.

**Response:** Total cyanide is one of the analytes on the priority pollutant list. DES presently requires that sludges be analyzed for total cyanide to receive an SQC and will maintain that requirement in this iteration of the rules.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Test Methods | **Monadnock AG,** |
| 9-21-98 | rfp | | | | |

**Comment:** "Table II volatile and semi volatile organic compounds must be analyzed in accordance with EPA Methods 8260B and 8270C, respectively." Should be added

**Response:**

(~~62~~) ~~Molybdenum, and for all toxic equivalents for dioxin~~ ***Dibenzodioxins and dibenzofurans using EPA method 1613 under Appendix A, 40 CFR Part 136. Detection limits shall be below the regulatory limits specified in Env-Ws 807.03(c)***;

(~~23~~) ~~The following~~ *V*volatile organic compounds analyzed in accordance with EPA method 8260*B*. ***Analytical detection limits shall conform to the limits specified in Table C-1 found in the department's "Contaminated Sites Risk Characterization and Management Policy", dated January 1998;***

| | | |
|---|---|---|
| ~~1,1-Dichloropropene~~ | ~~2-Chlorotoluene~~ | ~~Hexachlorobutadiene~~ |
| ~~1,1,1,2-Tetrachloroethane~~ | ~~2-Hexanone~~ | ~~Isopropyl benzene~~ |
| ~~1,2-Dibromo-3-chloropropane~~ | ~~2,2-Dichloropropane~~ | ~~Methyl-t-butyl ether (MTBE)~~ |
| ~~1,2-Dibromoethane~~ | ~~4-Chlorotoluene~~ | ~~m-Xylene/p-Xylene~~ |
| ~~1,2-Dichlorobenzene~~ | ~~4-Methyl-2-pentanone (MIBK)~~ | ~~Naphthalene~~ |
| ~~1,2,3-Trichlorobenzene~~ | ~~Acetone~~ | ~~n-Butyl benzene~~ |
| ~~1,2,3-Trichloropropane~~ | ~~Bromo benzene~~ | ~~n-Propyl benzene~~ |
| ~~1,2,4-Trichlorobenzene~~ | ~~Bromo chloromethane~~ | ~~o-Xylene~~ |
| ~~1,2,4-Trimethylbenzene~~ | ~~Carbon Disulfide~~ | ~~p-Isopropyl toluene~~ |
| ~~1,3-Dichlorobenzene~~ | ~~cis-1,2-Dichloroethene~~ | ~~sec-Butyl benzene~~ |
| ~~1,3-Dichloropropane~~ | ~~cis-1,3-Dichloropropene~~ | ~~Styrene~~ |
| ~~1,3,5-Trimethylbenzene~~ | ~~Dibromomethane~~ | ~~tert-Butyl benzene~~ |
| ~~1,4-Dichlorobenzene~~ | ~~Dichlorodifluoromethane~~ | ~~trans-1,3-Dichloropropene~~ |
| ~~2-Butanone (MEK)~~ | ~~Diethyl ether~~ | ~~Trichlorofluoromethane~~ |

(~~34~~) ~~The following~~ *S*semi-volatile compounds analyzed in accordance with EPA method 8270C. ***Analytical detection limits shall conform to the limits specified in Table C-1 found in the department's "Contaminated Sites Risk Characterization and Management Policy", dated January 1998;***

| | | |
|---|---|---|
| ~~1-Chloronaphthalene~~ | ~~2,6-Dichlorophenol~~ | ~~Benzoic Acid~~ |
| ~~1,2-Dinitro benzene~~ | ~~3-Nitroaniline~~ | ~~Benzyl Alcohol~~ |

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~~1,3-Dinitro benzene~~ ~~4-Chloroanaline~~ ~~Dibenzofuran~~

~~1,4-Dinitro benzene~~ ~~4-Nitroaniline~~ ~~Pentachlorobenzene~~

~~2-Nitroaniline~~ ~~Anilazine~~ ~~Pentachloronitrobenzene~~

~~2,2,5-Trichlorophenol~~ ~~Aniline~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05(b)(2)(3) VOC, semi VOCs | **Monadnock X**, |
| 9-10-98 | rfp | | | | |

**Comment:** The volatile and semi volatile organic compounds listed in these two sections are already part of the standard report for the analysis required under (b)(1) in Table II of 40 CFR 122. If DES decides to stay with this testing regimen, rather than identification of what is "expected to be present", the lists under (2) and (3) should be incorporated into (b)(1).

**Response:**

(~~4~~5) The ~~following~~ pesticides ***and polychlorinated biphenyls listed in Table 807-I(b)***,analyzed using appropriate methods.

~~2,4 Dichlorophenyl acetic~~ ~~Carbofuran~~ ~~Chlorpyrifos~~ ~~Dimethoate~~ ~~Malathion~~

~~Bendiocarb~~ ~~Carbaryl~~ ~~Diazinon~~ ~~Dinoseb~~ ~~Propoxur~~

(~~5~~6) The ~~following~~ additional ***analyses listed in Table I(c)*** ~~compounds:~~;

~~pH~~ ~~Percent nitrate-nitrite~~ ~~Percent potassium~~

~~Percent dry solids~~ ~~Percent total Kjeldahl nitrogen~~ ~~Percent phosphorus~~

~~Percent ammonia nitrogen~~ ~~Percent organic nitrogen~~ ~~Percent organic matter~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (b) (5) Ca, Mg | **NHWPCA AE**, |
| 9-23-98 | rfp | | | | |

**Comment:** Percent calcium and percent magnesium should be added to the list of nutrients required in sludge analysis. This will eliminate the need for the testing required in 806.10 (c) while providing all of the necessary information on sludge nutrient quality.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05(b)(2)(3)(4),(5) CAS Numbers | **Monadnock V** |
| 9-10-98 | rfp | | | | |

**Comment:** CAS numbers should be presented to facilitate identification of the analyte.

**Response:**

(67) ~~Molybdenum and for all toxic equivalents for dioxin.~~ ***Total cyanide; and***

***(8) For generators of class B sludge requesting certification of their sludge for reclamation uses, enteric viruses by ASTM-Method D 4994-89.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05(b)(6) Dioxin Method | **Monadnock Y,** |
| 9-10-98 | rfp | 9-18-98 | gcb | | |

**Comment:** Different test methods for dioxin have different detection limits depending on the resolution of the method. The type of method also specifies the dioxin compounds which are reported. DES should clarify which dioxin compounds must be tested for, their detection limits and which method should be used for analysis. DES should also consider using data a facility may have already developed to satisfy this (and other) testing requirements.

**Response:** The test method selected should be EPA method 1613, under Appendix A, Part 136 and should have lower detection limits than our proposed standards for dioxin and its toxic equivalents. Since the limits combine TCDD and TCDF, we would like to see the total from these two as well as the total from all of the other toxic equivalents. We will modify this section accordingly.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (b) Testing Frequency | **NHWPCA AD,** |
| 9-23-98 | rfp | | | | |

**Comment:** Sludges that obtain SQCs are required to continue testing during the term of the SQC. Unless these sludges exceed the standards contained in this rule during the term of the SQC there should be no need for increased testing frequency in order to renew the SQC. NHWPCA recommends that the first sentence of this section read: "*Upon submitting **the initial** application for a sludge quality certification,...*"

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (b) Testing | AF & PA R, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA believes that this section can be clarified by making the following changes.

**Proposed Alternative Language**

(b)(2) The following **additional** volatile organic compounds analyzed in accordance with EPA method 8260B, **that are above and beyond those specified within Table II of 40CFR Part 122 Appendix D:**

-------SAME--------

(b)(3) The following **additional** semi-volatile organic compounds analyzed in accordance with EPA method 8260C, **that are above and beyond those specified within Table II of 40CFR Part 122 Appendix D:**

-------SAME---------

(b)(4) Comment: Dinoseb is a herbicide and not a pesticide.

(b)(5) Comment: Add **Percent Calcium and Percent Magnesium** to the present list of compounds.

(b)(6) Molybdenum

**(b)(7) Dioxin and all the congeners of dioxin, expressed as toxic equivalents.**
[Comment: Toxic equivalents of dioxin also need to be added to the "definitions".]

**Response:**

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 807.05 Omitted PAH, Cn, and PCB Testing | Clean Water2 H, |
|---|---|---|---|---|---|
| 10-15-98 | rfp | mwr | 10-30-98 | | |

**Comment:** Polycyclic Aromatic Hydrocarbons (PAHs) appear to have been left out of this section. Perhaps this is simply an error (though you do refer to EPA method 8270c, rather than 8270, which includes PAHs), but given the appearance of significant quantities of many of these dangerous compounds in at least 2 of the 5 random tests done last year (particularly in SPF), this omission shouldn't go uncorrected. Also, for similar reasons, cyanide and PCBs should be included in this section.

**Response:** Cyanide, PAHs, and PCBs are all part of the priority pollutant list. Testing for these analytes is presently required and will continue to be required in this iteration of the rules.

(e*e*) ***After receiving a sludge certification,*** a~~A~~ll generators proposing to land apply, sell or otherwise give away their sludge in New Hampshire shall analyze their sludge at frequencies specified in Table 807- I*I*, below for the parameters listed ~~in Env-Ws 806.10 (a)~~ ***Table 807-I(c) above and for the metals in Table 807-I(a) above except for Antimony, Beryllium, Silver, and Thallium.***

Table 807-I*I*
Frequency of Monitoring - Land Application

| Quantity of Sludge* (wet tons) | Frequency |
|---|---|
| 0 - ~~318~~ ***1600*** | Once per 180 days |
| ~~319~~ ***1600*** - ~~1652~~ ***8250*** | Once per quarter |
| ~~1653~~ ***8250*** - ~~16533~~ ***82,600*** | Once per 60 days |
| > ~~16,533~~ ***82,600*** | Once per month |

* Total quantity of sludge generated in a calendar year that is land applied, sold, or given away in a bag or other container ***greater than 100 pounds*** for application to the land.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Test Every Load | N.H.Sierra Club |
| 9-28-98 | rfp | | | | |

**Comment:** All sludge loads should be tested for heavy metals and organic chemicals

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05© Sampling Reduction Plan | **NEBRA B,** |
| 9-28-98 | rfp | | | | |

**Comment:** Some NEBRA members felt that it is difficult to find enough potential reductions of regulatory burden to provide enough incentive in the realm of reducing regulatory requirements. However, it was suggested that perhaps, over the years, significant cost savings could be introduced at the SQC permit level: if biosolids is consistently testing very clean, why not reduce the SQC testing burden after a certain time? If the reduced tests showed any increase of concern, the plant could be required to go back to more frequent and onerous testing protocols.

It was also noted that by reducing site restrictions or the requirement for an Order 1 Soil Survey for very low metal biosolids, some incentive could be created. If a biosolids has very low metals, it is not dissimilar from manures and the Order 1 Soil Survey may be less important.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (c) Testing | AF & PA S, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA proposed the following changes to clarify the frequency that metals analyses have to be performed in accordance with Table 807-I.

**Proposed Alternative Language**

(c) All generators proposing to land apply, sell or otherwise give away their sludge in New Hampshire shall analyze their sludge at frequencies specified in Table 807-I, below for the parameters listed in Env-Ws 806.10 (a).

Table 807-I

Frequency of Monitoring - Land Application

| Quantity of Sludge* (dry tons) | Frequency |
|---|---|
| *0 - 500* | *Once per 180 days* |
| ***501 - 3000*** | *Once per quarter* |
| *3001 - 18000* | *Once per 60 days* |
| > **18000** | Once per month |

* Total quantity of sludge generated in a calendar year that is land applied, sold, or given away in a bag or other container for application to the land.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Limits & Frequency | Clean Water2 G, |
| 10-15-98 | rfp | | | | |

**Comment:** It should be reasonable to require levels closer to estimated ambient levels in soil (about 1-5 ppt TEQ for dioxin, which most SPF sludge should pass. Also, Dioxins and VOCs should be tested for more than just once a year after SQC is given, especially for SPF, since the results of the random testing last year showed wide variation in VOC levels and detection quality.

**Response:**

(~~d~~*f*) ~~Subject to (c) below, t~~*T*he sludge quality certification holder shall ~~submit the results of an analysis of the~~ ***analyze*** sludge from its treatment facility or facility every year for the constituents identified ~~in Env-Ws 807.05(a).~~ below:

***(1) Antimony, Beryllium, Silver and Thallium;***

***(2) Dibenzodioxins and dibenzofurans as specified in Env-Ws 807.05(d)(2);***

***(3) Volatile organic compounds as specified in Env-Ws 807.05(d)(3);***

***(4) Semi-volatile compounds as specified in Env-Ws 807.05(d)(4);***

***(5) Pesticides and polychlorinated biphenyls as specified in Env-Ws 807.05(d)(5);***

***(6) Total cyanide; and***

***(7) For generators of class B sludge proposing to maintain certification of their sludge for reclamation uses, enteric viruses by ASTM-Method D 4994-89.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (d) Testing | AF & PA T, |
| 10-14-98 | rfp | | | | |

**Comment:** Since the Department had intended paragraph (d) to require annual testing, AF&PA believes that annual testing for sludges is duplicative and unnecessary and recommends that such testing be conducted biennially.

**Proposed Alternative Language**

(d) The sludge quality certification holder shall submit the results of an analysis of the sludge from **waste water** its treatment facility or facility **every other year (end of years 1, 3 and 5) for the constituents identified in Env-Ws 807.05(b)(1) through (b)(6), unless significant process changes occur. If significant process changes do occur, the holder must within 60 days of the process change, reanalyze sludges in accordance with 807.05(b) and provide the Department with copy of the laboratory analysis and a summary of findings. The analytical results from year 5 can be utilized for reapplying for a Sludge Quality Certification pursuant to Env-Ws 807.05 (b).**

**Response:**

(eg) Additional testing shall be required when~~, based on~~ the ~~information submitted, the department determines that the sludge or sludge-derived product is known to contain constituents in concentrations which may have an adverse effect on public health or the environment.~~ ***results of testing conducted by the sludge quality certification holder, site permit holder, or the department show that the requirements in Env-Ws 807.03 have not been met.***

***(h) If additional testing is required under (g) above, the sludge quality certification holder shall cease land application of sludge until the additional testing demonstrates that the sludge is acceptable for land application according to the standards of Env-Ws 807.03.***

***(I) Additional testing shall be done according to the following procedures:***

***(1) Collect and analyze representative sample of sludge from each stockpile at each site which contains the generator's sludge for the constituent(s) of concern and submit results to the department for review. Stockpiles of sludge meeting the standards in Env-Ws 807 can be land applied .***

***(2) Increase the frequency of testing at the generator's facility for that compound(s) of concern to weekly; continue the weekly sampling until 4 successive weeks show that the concentration of that constituent(s) meets the standards in Env-Ws 807.03; and***

***(3) After complying with (2) above, resume land application and increase sampling frequency specified in Env-Ws 807.05 to monthly for that ~~particular~~ constituent(s) of concern for six months.***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (e) Testing | AF & PA U, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA is greatly concerned about this section. It is vague and does not any provide guidance as to how and by what means additional testing will be required or why such a requirement would be triggered. AF&PA believes strongly that the mere presence of a "constituent in concentrations which may have an adverse effect" is not sufficient to provide reasonable notice to generators or facility operators when and whether additional testing might be required. In addition, AF&PA believes that this section may be inconsistent with the DES Risk Characterization Management policy (January 1998) Regarding the RCMP, what Table or Appendix (and column) would the Department reference? How would the Department take into consideration that the RCMP values were primarily developed for petroleum sites. How would the Department justify the scientific correlation between values for petroleum sites and sludge land application sites? In addition, since the RCMP values primarily represent concentrations in "ambient" soils, would the DES allow for some incremental increases considering the sludge naturally represents a concentration of constituents as a result of treatment processes?

**Proposed Alternative Language**

Additional testing may be required when, based on the information submitted, the Department, **in conjunction with the Bureau of Health Risk Assessment, determines that the analyses on the sludge demonstrate that land application of such could have an adverse effect on public health or the environment. In the event that the Department does not have any established values for the given constituents, DES shall preferentially utilize the values within EPA's 503 Final rule as a default value or, in their absence, develop new constituent concentrations in conjunction with the Bureau of Health Risk Assessment.**

**Response:**

(~~f~~***j***) The department ~~may~~ ***shall*** reduce the number of constituents required to be tested annually if it determines that the concentration of the constituent found in the sludge will not have an adverse effect on public health or the environment.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (f) Testing | AF & PA V, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA is pleased that the Department has demonstrated the flexibility to allow reduced testing if certain constituents are not present, or are present in sufficiently small concentrations. AF&PA believes that the section needs to be more explicit as to what information can be used to make that demonstration.

**Proposed Alternative Language**

(f) The department may reduce the number of constituents required to be tested annually if it determines that the concentration of the constituent found in the sludge **is below the levels established within §806.08(m) or (o)** or other appropriate standards. The Generator may base its **demonstration on process data, purchasing records for chemicals acquired (such as Material Safety Data Sheets), and historical data, including but not limited to internal operating programs, random spot analyses by Federal/State regulatory agencies, RCRA hazardous waste test data, and established Permit programs, such as those under the provisions of the Clean Water Act (NPDES and/or State approved pretreatment programs).**

**Response:**

~~(g) If the analyses of 2 of the 3 representative samples required in (a) above, for metals, PCB's, or dioxin indicates that the concentration of a constituent exceeds the concentration of that constituent specified in Env-Ws 806.08(m) or (o), as applicable, the department shall deny the application for a sludge quality certification.~~

~~(h) If the analyses of one of the 3 representative samples required in(a)above, for metals, PCB's or dioxin indicates that the concentration of a constituent exceeds the concentration of that constituent specified in Env-Ws 806.08(m) or (o), as applicable, the department shall require 2 additional analyses for that compound taken at least 60 days apart.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Averaging test results | **Citizens**, **Shields B**, Clean Water2 I, |
| 8-20/9-25-98 | mwr/rfp | | | | |

**Comment:** Averaging of testing results during the SQC process will allow poor quality sludges to be spread in NH. Each result should be required to meet the standard. Given the wide variation in contaminant types and level from one quantity of sludge to the next, averaging of data will only serve to hide the most toxic loads of sludge behind an inappropriate and deceptive monitoring procedure.

**Response:**

~~(I) If the analyses of both samples, required in (g*i*) above, or the average for the 5 samples indicates that the concentration of that particular constituent does not exceed the concentration specified in Env-Ws 806.08(m) or (o), as applicable, the department shall approve the application for a sludge quality certification.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (g),(h),(I) Testing | AF & PA W, |
| 10-14-98 | rfp | | | | |

**Comment:** Paragraph (I) needs to be corrected to make reference to "…**required in paragraph (h) above,** …" rather than "paragraph (g)".

**Response:**

~~(j) If the analyses of the testing required in (e*e*) above, or if any other testing conducted by the applicant, generator, or the department indicates that the concentration of a constituent in the sludge exceeds the concentration of that constituent specified in Env-Ws 806.08(m) or (o), as applicable, the applicant shall:~~

~~(1) Cease land applying that generator's sludge;~~

~~(2) Collect a representative sample of sludge from each stockpile at every site which contains the generator's sludge and have it analyzed for the constituent of concern. and~~

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~~results to the department for their review;~~

~~(3) Increase the frequency of testing at the generator's wastewater treatment facility for that particular compound to weekly; continue the weekly sampling until 4 successive weeks show that the concentration of that constituent is below the concentration specified in Env-Ws 806.08(m) or (o), as applicable;~~ ***and***

***(4) After complying with (3) above,*** ~~increase sampling frequency specified in Env-Ws 807.05(b) to monthly for that particular constituent.;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (j) Testing | AF & PA X, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA believes that the DES approach to discoveries of sludges with elevated constituent levels relative to §806.08(m) or (o) is totally inappropriate. As presently written, this provision would easily shut down an entire land application program based on a single sampling analysis. Furthermore, if one "bad" analysis were taken, the applicant would be bound to go into the field to test multiple stockpiles at multiple sites where his/her sludge had been sent after the last so-called "good" analysis. This is totally impractical. The EPA/AF&PA MOU, previously referenced, provides an approach which requires additional information – testing – to determine whether the elevated level is a laboratory mistake or a real problem. Once the additional information is available, then a reasoned management decision can be made.

Similarly, since DES has already included this type of approach in paragraphs (h) and (I), AF&PA recommends that the more pragmatic approach is to require repeat analyses to verify the results and then to act accordingly.

**Proposed Alternative Language**

(j) If the analyses of the testing required in (c) above, or if any other testing conducted by the applicant, generator, or the department indicates that the concentration of a constituent in the sludge exceeds the concentration of that constituent specified in Env-Ws 806.08(m) or (o), as applicable, the applicant shall:

**(1) immediately take 2 additional samples for analysis, and**

**(2) if the analyses of both samples or the average for the 3 samples indicates that the concentration of the particular constituent (metal) does not exceed the concentration specified in Env-Ws 806.08(m) or (o), as applicable, the applicant may continue with the land application program, or**

**(3) if the analyses of both samples or the average for the 3 samples indicates that the concentration of the particular constituent (metal) does exceed the concentration specified in Env-Ws 806.08(m) or (o), the applicant shall:**

Cease land applying sludge,

Initiate a review of production/treatment processes that may be causing the exceedance, and

Increase the frequency of testing at the generator's wastewater treatment facility for that particular compound to weekly and continue the weekly sampling until 4 successive weeks show that the concentration of that constituent is below the concentration specified in Env-Ws 806.08(m) or (o), as applicable.

**Response:**

~~(k) For constituents required to be analyzed under Env-Ws 807.05(bc) *above* detected in the sludge, the applicant will propose for department approval, in consultation with the department of health and human services, or, at the department's discretion, the department may develop in consultation with the department of health and human services, facility-specific standards. These standards will be developed by risk assessment methods described in the United States Environmental Protection Agency's Soil Screening Guidance, EPA/540/R-96/018 dated April 1996, the American Society for Testing and Material's E-1730-95, Guide for Risk-Based Corrective Action Applied to Petroleum Relapse Sites dated November, 1995, or equal.~~

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 807.05 Organic risk methods | **Citizens,** |
|---|---|---|---|---|---|
| 8-20/9-25-98 | mwr/rfp | 9-16-98 | gcb | | |

**Comment:** DES will not be able to formulate a credible risk assessment for land application of toxic organics in sludge. The rules should continue to apply the hazardous waste mixture rule to regulate organics in sludge.

**Response:** See General Policy.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (k) Organic Compounds | **NHWPCA AF,** |
| 9-23-98 | rfp | | | | |

**Comment:** In the EPA's risk assessment used to determine concentration limits for compounds occurring in biosolids, organic compounds were determined to not be present in quantities that would be harmful to human health and the environment when recycling biosolids. In these proposed rules, DES is requiring testing for organic compounds even though no standards currently exist for the concentrations of these compounds in biosolids. Too often, the mere detection of a constituent in biosolids is interpreted as a potential health or environmental risk. In order to avoid misinterpretation of sludge analyses, it is important that standards are in place for all required analytes. Additionally, it is important that the public and regulated community be given the opportunity to comment on these standards.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 806.07(5)(k) Risk Assessment | BiogroAB AX, |
| 10-5-98 | rfp | | | | |

**Comment:** For reasons stated earlier, it is inappropriate to require a site specific risk assessment because a compound has been detected. The Bureau of Health Risk Assessment has conducted its own review of biosolids quality standards and provided their recommendations to the Department, which are incorporated in these proposed rules. These recommendations identified a more stringent concentration standard for only 3 metals. Furthermore, the guidance document cited as the methodology for review was developed to address environmental and health concerns associated with contaminated soils. This is not an appropriate methodology to use to determine concentration limits in biosolids or other organic residuals. If the Department believes that it is necessary to further review these compounds beyond the review conducted during the development of the federal rule, then they should undertake a risk assessment based upon material concentrations and their use and not upon clean-up standards for contaminated soils which include assumptions about different soil environments and groundwater pathways. **Therefore, this section should be deleted.**

**Response:**

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

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| date | initials | date | initials | 807.05 (k) Testing | AF & PA Y, |
|---|---|---|---|---|---|
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA is very concerned with this provision. The determination to have a risk assessment conducted is a serious and costly one and cannot be made arbitrarily and without the input of the generator/facility operator. Of particular concern is that since the Department has not established limits on constituents other than in §806.08 (metals), it must be very careful in contemplating risk assessments for other constituents. The Department cannot arbitrarily require any applicant to perform a risk assessment even if there are detectable levels of constituents identified in §807.05(b). AF&PA strongly recommends that the Department must establish a clearly identified trigger for such risk assessments, and do so in collaboration with the Bureau of Health Risk Assessment, industry, trade, and UNH representatives.

The decision to undertake a risk assessment must rest with the applicant -- not DES. Conceivably, the Department could have any number of site/facility operators simultaneously performing Risk Assessments for individual sites throughout the State. This, if allowed to happen, would quickly lead to chaos. Additionally, this section requires the development of facility-specific standards, where as §806.08(q), which is identical in wording, requires the development of site-specific standards. AF&PA does not believe that it was the Department's intent to require the development of site-specific standards on each and every site throughout the State because of the mere detection of a constituent. These two sections need to be evaluated concurrently due to their potentially overlapping requirements and the need to clarify the Department's expectations.

Additionally, the development of any standards (if determined to be necessary), should be prepared by the same (governmental) agency which is not only familiar with risk assessment procedures but was also responsible for establishing the standards within the RCMP, specifically the Bureau of Health Risk Assessment. The only possible exception to this should be in the event that an applicant would like to propose the application of sludge having constituents at levels higher then established standards. In such a case, the applicant may, at their own expense, perform a site specific risk assessment to establish and determine if a higher level is in fact still protective of public health and the environment. If demonstrated to be adequately protective, then any such risk assessment would understandably (as part of a check and balance) have to be approved by the same (governmental) agency, the Bureau of Health Risk Assessment.

Lastly, this section focuses on the constituents under §807.05(b), which primarily pertain to the priority pollutants (VOC's, Semi-VOC's, metals, and pesticides) plus dioxin (b)(6). As standards have long been established for metals and dioxin, these two classes of analytes should be relatively straightforward to address. However, the regulation states that the remaining classes of analytes, namely VOC's, Semi-VOC's and pesticides (pursuant to EPA Method 8260B and 8270C respectively), are also included under this provision. DES staff have acknowledged that the parameters and values contained within the RCMP (Table 3, specifically the VOC's and the Semi-VOC's) are the principal parameters of concern, yet no mention is made whatsoever to the RCMP (and the various Tables/Appendices within it) within the proposed rule. AF&PA is most concerned that DES is seriously contemplating the development of Standards for these compounds. However, a panel of nationally recognized scientists, working over a period spanning more then a decade, has determined that it was not necessary to establish constituent concentrations for VOC's, Semi-VOC's and pesticides for municipal biosolids. Our recommendations to deal with this most significant and contentious issue are presented below.

**Proposed Alternative Language**

(k)(1) For those constituents analyzed in Table II (40CFR Part 122), as well as those identified under §807.05(b)(2), (3) and (4), the Department, in conjunction with the Bureau of Health Risk Assessment, may determine it to be necessary to develop facility-specific (or site-specific for §806.08(q)) standards. Before such standards are in fact developed, the Department must first conclude that the analyses on the generator sludge contain constituents whose concentrations continue to display a pattern that, if allowed to continue, may have an

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~~(l) The department may approve the application for sludge quality certification with conditions relative to future sampling. The department may require intensive sampling programs for specific constituents if, based on the historical data provided in the sludge quality data report, or the testing required in Env-Ws 807.05(b), the average sample results for a specific constituent are within 80% of the concentration specified in Env-Ws 806.08(m) or (o), as applicable, or as established employing procedures under Env-Ws 807.05(k), or if the sludge quality is highly variable.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 (l) Testing | AF & PA Z, |
| 10-14-98 | rfp | | | | |

**Comment:** AF&PA recommends that the Department define the term "highly variable".

**Response:**

~~(m) If the analyses of the testing required in (c) above, or if any other testing conducted by the applicant, generator or the department indicates that the concentration of a constituent in the sludge exceeds the concentration of that constituent specified in Env-Ws 806.08(m) or (o), as applicable, the applicant shall:~~

~~(1) Cease land applying that generator's sludge;~~

~~(2) Collect a representative sample of sludge from each stockpile at every site which contains the generator's sludge and have it analyzed for the constituent of concern. Submit results to the department for their review; and~~

~~(3) Increase the frequency of testing at the generator's wastewater treatment facility for that particular compound to weekly, continue the weekly sampling until 4 successive weeks show that the concentration of that constituent is below the concentration specified in Env-Ws 806.08(m) or (o), as applicable increase sampling frequency specified in Env-Ws 807.05(b) to monthly for that particular constituent~~

~~***(o) Copies of the laboratory data sheets for all testing described in the report shall be retained by the applicant for the duration of the sludge quality certification***~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 807.05 Testing | Tras Berg B |
| 10-21-98 | rfp | | | | |

**Comment:** To carry out testing to this extent will be unwieldy and cumbersome to the recycling of biosolids. Lets stop treating sludge as suspectedly contaminated and start encouraging its utilization with fair, science-based rules. The measures in this section are not justified by the amount of knowledge based on scientific research of biosolids.

**Response:**

Env-Ws 807.06 Reporting.

(a) Every sludge quality certification holder shall submit an annual report by the last business day of January following the issuance of the certificate which contains the following information:

(1) The name and address of the treatment facility which generated the sludge;

(2) Name and telephone number of the operator of the facility;

(3) The sludge quality certificate number;

(4) The quantity of sludge generated, in dry tons, and the final disposition of the material; ~~and~~

(5) The results of all testing required by the department and EPA during the previous year.; ***and***

(6) The proposed updated label as required under Env-Ws 807.06, if applicable.

(b) ~~If the annual report is not submitted to the department by the last business day in January, the department shall proceed in accordance with Env-Ws 804.05 to suspend or revoke the permit.~~

**PART Env-Ws 808 FACILITY PERMIT REQUIREMENTS**

Env-Ws 808.01 Facility Permit Applications.

(a) The person ~~who owns the property on which~~ ***proposing to undertake the sludge management activities at*** the facility ~~is proposed~~ shall apply for the facility permit.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(a) Issuance | **BFI #56w CO,** |
| 10-20-98 | rfp | 10-27-98 | gcb | | |

**Comment:**

**General Comment: As proposed, facility permits may be issued solely to the property owner. See also 804.06(b).**

**General Comment: As proposed, facility permits are issued only to the property owner. Because almost all site and facility permits occur on the same parcel of land and will be managed by the applicant, BFI Organics feels the Department should continue to accept applications for site and facility permits from the party who will actually manage the site or facility (generally the applicant).**

**Response:** We have deleted the requirement that only the property owner can apply for a facility permit.

(b) The applicant for a facility permit shall provide the following information on a form obtained from the department:

(1) The name, address, ~~date of birth,~~ and home telephone number of the applicant, if an individual;

(2) The name, address, and telephone number of the applicant's business;

(3) ***The name and telephone number of the person who can be reached 24 hours a day*** ~~Any emergency telephone numbers to be used~~ in case of emergency;

(4) The location of the proposed facility, including street address, tax map and lot number, and current deed reference;

(5) The name(s), mailing address(es), and ~~business and emergency~~ telephone number(s) of each ~~current or proposed~~ operator of the facility including each person's responsibility as it pertains to the regulated activities;

(6) The types of ***sludge management*** activities being proposed at the facility, ~~such as~~ ***including but not limited*** to, composting, processing, stockpiling, or treating;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(c)(6) Wetland Location | **P. Adams #33w L,** |
| 10-13-98 | rfp | 10-28-98 | gcb | | |

**Comment:** Add: "..including a description ***and location*** of each soil type ***and any wetlands*** found on the site.
REASON: Must identify where the soils are and any wetlands. Wetlands can exist where soil types are other than hydric and can appear since soil maps were prepared, e.g. beaver dams, road construction, etc.
**Response:** As this requirement is already included in Env-Ws 808.06(m), it is not necessary to include it here.

(7) A description of the intended capacity and life of the facility; and

(8) A history of the ~~site~~ use of the land on which the facility is proposed covering 5 years immediately prior to submission of the application.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(c)(8) Map Scale | **P. Adams #33w M,** |
| 10-13-98 | rfp | 10-28-98 | gcb | | |

**Comment:** Add: "..recent USGS map, ***largest scale available, i.e. most detail,*** with the latitude.."
REASON: Provide maximum information and data available.

**Response:** We have revised this section to incorporate your suggested language.

(c) The following shall be submitted with the application:

(1) ***If applicable, f***acility ~~design~~ plans and specifications ***for construction and closure*** stamped by a professional engineer registered in the State of New Hampshire;

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(c)(1) Engineer's Stamp | **NHWPCA #29w AG,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The requirement for a professional engineer's stamp on facility design plans is not necessary and should be eliminated if there is no construction or engineering involved in preparing a facility for regulatory approval.

**Response**: We have revised this section to clarify our intent.

(2) The facility plan prepared in accordance with Env-Ws 808.06;

(3) The management plan prepared in accordance with Env-Ws 808.07;

(4) A statement signed by the applicant certifying that:

a. The notification provisions of Env-Ws 803.01 have been complied with;

b. All operators of the facility have ~~a copy~~ ***been instructed on the requirements*** of Env-Ws 800 or ~~will~~ ***shall*** have a copy prior to working at the facility;

c. A copy of the application has been given to the governing body of the municipality in which the activity is proposed to occur; and

d. The information submitted is accurate;

~~(5) A copy of the groundwater permit, if one has been issued for the facility, or a copy of the application, if one is needed but has not yet been issued;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(c)(5) Groundwater Permit | **BFI #56w CP**, |
| 10-20-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Reword(5) For any sludge facilities which will process over 5000 wet tons annually and for which a drinking water well is located within 1000 feet of the facility, a groundwater monitoring plan, which shall include:

a) Monitoring well location(s) and rationale for location(s);
b) A description of monitoring well specifications;
c) Sampling frequency;
d) Parameters for analysis.

**General Comment: Groundwater permits should not be required for a facility where there is adequate protection of groundwater through the use of impervious pads or approved management practices. If the department concludes, due to site specific conditions, including facility size, volume of sludge to be managed and proximity to potential receptors, that groundwater monitoring is necessary, BFI Organics proposes that a groundwater monitoring plan be proposed.**

**Response:** We have removed the requirement for obtaining a groundwater permit.

***(5) For those facilities listed in Env-Ws 809.01, a groundwater monitoring plan in accordance with Env-Ws 809.03.***

(6) A copy of the natural resource conservation service county soils survey map, or portion thereof, with the area(s) of proposed activity clearly delineated, including a description of each soil type found on the site;

(7) ~~A~~*The* description of *the soil profile characteristics of* each soil test pit~~'s~~ or auger boring~~'s soil profile characteristics, including depth to seasonal high water table, bedrock, or other restrictive layer~~ *as required in Env-Ws 808.10(d)*.

(8) An original of the most recent USGS map, ***largest scale available*** with the latitude and longitude, showing the ***approximate*** location ***and boundaries*** of the facility;

~~(9) A copy of the storm water permit, if one has been issued for the facility, or a copy of the application, if one is needed but has not yet been issued;~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(c)(9) Stormwater Permit | **BFI #56w CQ**, |
| 10-20-98 | rfp | 10-20-98 | gcb | | |

**Comment:** **General Comment: Under what circumstances would the Department anticipate that a stormwater permit would be required?**

**Response:** Some sludge landfills or compost facilities could be required to obtain a stormwater permit from EPA.

(~~10~~*9*) Written verification from the department of resources and economic development ~~that no presence of~~ ***indicating whether or not*** a threatened or endangered species exist on the site;

(~~11~~*10*) For all lagoons, a~~n order I soils~~***site specific soil map or*** survey prepared in accordance with the Site-Specific Soil Mapping Standards for New Hampshire and Vermont, Society of Soil Scientists of Northern New England Publication No. 3, dated June 1997 ~~and as amended from time to time~~;

***(11) For sludge monofills, financial assurance shall be provided in accordance with the requirements of Env-Wm 3100 of the solid waste rules.***

(13*2*) A copy of the facility closure plan as specified in Env-Ws 808.09;

(14*3*) A list and copies of all other state permits which are required for the proposed facility and evidence that applications for those permits have been submitted;

~~(15) A list of all ordinances and bylaws which affect the proposed sludge management activity and a narrative description explaining the steps that will be taken to ensure compliance with them; and,~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(c)(15) Local Ordinances | **BioGro #44w AY, BFI #56w CR,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** It is inappropriate and unnecessary for the Department to be reviewing local ordinances and an applicant's anticipated compliance with those regulations. If a municipality chooses to adopt an ordinance regulating biosolids recycling, then it is the municipalities responsibility to determine if the proposed project meets the requirements of their ordinance. The Department's regulatory authority is limited to its rules and regulations and any determinations of a permit application must be made by the Department independent of local ordinances. **As the Department has no review or enforcement authority over local ordinances; this section should be deleted.**
**General Comment: This is unduly burdensome and beyond the scope of the Department's authority. The local governing body, not the Department, is responsible for the enforcement of local ordinances and regulations.**

**Proposed Language: Delete Env-Ws 808.01(c)(15).**

**Response:** We have deleted this section.

***(14) The name and address of the locally accessible place where all the information required in Env-Ws 808.01 can be reviewed.***

(165)Whether the applicant has been convicted of a misdemeanor under any statute ~~implemented~~***administered*** by the department within the 5 years prior to the date of application, or of a felony ~~under any statute implemented by the department within~~ ***in any state or federal court during*** the 10 years prior to the date of application.

***(d) If the applicant is not the owner, the application shall be accompanied by a written statement in accordance with (e) below, and signed by the owner.***

***(e) The written statement shall say that the owner is aware that the application is being filed and has given permission to the applicant to file the application and to enter upon the land for purposes of site investigation and operation of the facility in the event that the department issues the permit.***

(~~d~~*f*) If the applicant is not the generator of the sludge(s), the application shall be accompanied by a written statement signed by each generator stating that the generator is ~~aware that they are~~ ultimately responsible for ensuring that the final disposition of the material is performed in accordance with these rules and 40 CFR Part 503.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.01(d) Responsibility | **BFI #56w CS**, |
| 10-20-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: What is the Department trying to accomplish with this requirement? What is the statutory basis for this requirement? RSA 485-A does not appear to place liability, let alone strict liability, on the generators of sludge. Moreover, 40 CFR Part 503, by its terms, applies only to municipal wastewater treatment facilities, not industrial wastewater treatment facilities. The issue of ultimate responsibility for sludge disposal is, in fact, a contractual matter between the generator and the party who contracts to handle it. The department cannot through rulemaking create a legal liability where none exists under statute.**

**Proposed Language: Delete Env-Ws 808.01(d).**

**Response:** We believe that it is important for the generator to remember that he/she is ultimately responsible for ensuring that his/her sludge is disposed of in accordance with these rules.

(e*g*) Each application shall be:

(1) Signed by the applicant;

(2) Submitted in duplicate ~~if the facility is adjacent to a river designated in accordance with RSA 483, New Hampshire rivers management and protection program~~; and

(3) Accompanied by the fee specified in Env-Ws 808.04.

Env-Ws 808.02 Expiration of Facility Permits.

(a) A facility permit issued by the department shall expire 5 years from the date on which it was issued.

(b) Any person operating a facility prior to adoption of these rules without a valid permit pursuant to Env-Ws 800 shall:

(1) Within 90 days from the effective date of ~~these rules~~ ***the 1999 amendments to the Septage and Sludge Management Rules***, comply with all applicable provisions of Env-Ws 800, other than notification and permitting requirements;

(2) Within 90 days of the effective date of ~~these rules~~ ***the 1999 amendments to the Septage and Sludge Management Rules***, submit facility plans, management plans, contingency plans, and closure plans; and

(3) Within 180 days of the effective date of ~~these rules~~ ***the 1999 amendments to the Septage and Sludge Management Rules***, submit a permit application. If a permit is denied, all sludge management activities ~~must~~ ***shall*** cease and all material ***shall be*** removed from the facility ~~or~~ ***and the facility shall be*** closed in accordance with Env-Ws 808.09.

Env-Ws 808.03 Renewal of Facility Permits. Any person to whom a facility permit has been issued, and who wishes to renew the permit, shall ***apply for a permit modification under Env-Ws 804.08(b) and*** submit the ~~information required in Env-Ws 808.01 and the application~~ ***permit*** fee required by Env-Ws 808.04 to the department no later than 180 days prior to expiration of the permit.

Env-Ws 808.04 ~~Application and Annual~~ ***Permit*** Fees.

(a) A fee in the amount of $500 shall accompany each application for issuance or renewal of a facility permit to compost sludge.

(b) A fee in the amount of $1,000 shall accompany each application for issuance or renewal of a facility permit to mix, treat, process, or dispose of sludge other than for sludge composting.

~~(c) Subject to (d) below, the permit holder shall pay an annual fee of $5 per dry ton of sludge that is received during the previous year at the facility.~~

~~(d) For those facilities which produce a sludge-derived product, the permit holder shall pay an annual fee of $1 per dry ton for sludge received during the previous year.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.04(d) Fee Structure | **Monadnock #26w Z,** |
| 9-10-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Don't you need a facility to produce a sludge derived product? If so, isn't this $1 per dry ton a redundant charge? This section needs to be clarified.

**Response:** Removed the fee

(**ec**) Any New Hampshire municipality that applies for a facility permit or has its sludge managed at a facility shall be exempt from the fee*s* specified in (a) ~~through~~ ***and*** (~~d~~**b**) above.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.04(e) Discriminatory Fees | **BioGro #44w AZ,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Exempting New Hampshire municipalities from the annual fees is discriminatory and unconstitutional. Furthermore, it places the entire burden of funding on out of state or private sources. For example, a food processor may produce a biosolids product that is suitable for composting. This fee provides an economic disincentive to the plant to use a larger facility to process its biosolids. In addition, this provision violates interstate compact statutes and cooperative agreements and hinders the development of regional solutions for biosolids management. A good example of the benefits of regional solutions is the Salem, New Hampshire use of the Greater Lawrence Sanitary District for treatment for its wastewater. New Hampshire relies on working with our neighbors to find economical and environmentally sound solutions for addressing our biosolids management, and the Department's regulations should reflect New Hampshire's support of regional solutions.

**Response:** We have removed the annual fee.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.04(e) Inequitable Fees | **BFI #56w CT,** |
| 10-20-98 | rfp | 10-21-98 | gcb | | |

**Comment:** The proposed fee system is inequitable. Private parties should not be expected to bear the entire financial burden or a disproportionate amount of the financial burden for the department to implement a sludge or septage management program.

Proposed Language: Delete Env-Ws 808.04 (e)

**Response:** We have removed the annual fee.

(~~f~~**d**) Fees ~~shall be in the form of a~~ ***if paid by*** check or money order, ***shall be made*** payable to "Treasurer-State of NH".

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.04 Unjust and Confusing Fees | **NHWPCA #29w AH,** |
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** There should be parity in application and annual fees between composting and all other types of approved sludge processing technologies. There is no justification for favoring composting over other processes. This financial burden may in fact discourage innovative technologies for sludge processing.

The fee schedules in this regulation are confusing. NHWPCA recommends that the fees should all be listed on one page to avoid confusion and incorrect payments. Again, note that NH municipalities are exempt from any unfunded mandates.

**Response:** We have removed the annual fee.

Env-Ws 808.05 Criteria for Review. The department shall issue or renew a facility permit if it determines that the following criteria have been met:

(a) All applicable requirements of the rules have been met;

(b) All state permits which are necessary for the construction and operation of the facility have been ~~obtained and submitted to the department~~ ***applied for***;

(c) Management of sludge at the facility, in accordance with the application, ~~will~~ ***shall*** not violate any statues or rules implemented by the department;

(d) The permit holder has not been convicted of a misdemeanor under any statute ~~implemented~~***administered*** by the department within the 5 years prior to the date of application, or of a felony ~~under any statue implemented by the department within~~ ***in any state or federal court during*** the 10 years prior to the date of application; and

(e) The permit holder has paid all fees and administrative, civil, or criminal penalties owed to the department.

***(f) The sludge management activities which will be conducted at the facility will not adversely affect the threatened or endangered species.***

Env-Ws 808.06 Facility Plans. Facility plans required under Env-Ws 808.01(c)(2) shall be at a scale appropriate to show all information contained on the plan clearly and ~~shall~~ include the following:

(a) A locus map which identifies the proposed facility location and details the proposed route of access to the site;

(b) The total available land area, in acres, and the specific acres to be used for facility operations, including proposed stockpile or storage tank locations;

(c) The identification of access roads and access control measures, including perimeter fencing and buffer distances;

(d) The identification of roads, property lines, structures whether on or off the property, and

any easements or rights-of-way which exist on the property;

(e) The identification of proposed measures to control surface runoff to or from the facility and stockpile locations, if applicable;

(f) The identification of surrounding land use within ~~1000~~ ***500*** feet;

(g) All soil test pit and auger boring locations ~~shown as follows:~~;

~~(1) One soil test pit or auger boring for each soil mapping unit present on the natural resource conservation service county soils map, but no less than on every 5 acres; and~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.06(g)(1) NRCS is Sufficient | **NHWPCA #29w AI**, |
| 9-23-98 | rfp | 10-28-98 | gcb | | |

**Comment:** The Natural Resource Conservation Service (NRCS) soil map is sufficient to provide guidance for agricultural use of organic residuals. There is no need to do soils investigations beyond the scope of the NRCS soil surveys when applying residuals to soil at agronomic rates.

**Response:** As the NRCS soils maps can be somewhat dated, DES believes that it is appropriate to require additional testing.

~~(2) One soil test pit or auger boring for each area proposed for stockpiling;~~

(h) The ***approximate*** location of and distance to all dwellings, structures, and water supply wells within ~~1000~~ ***500*** feet of the facility;

(I) The names and addresses of all abutters;

(j) The name and location of all surface waters within 500 feet of the facility , including their designated river classification ~~in accord with~~ ***under*** RSA 483, New Hampshire rivers management and protection program, if applicable;

(k) The scale of the plan;

(l) An arrow indicating which direction on the plan is north;

(m) The location of all wetlands within ~~250~~ ***500*** feet of the ~~sites~~***stockpile areas,*** delineated on the basis of hydrophytic vegetation, hydric soils, and wetlands hydrology, in accordance with the techniques outlined in the "Corps of Engineer's Wetland Delineation Manual, Technical Report Y-87-1", January, 1987 ***and "Field Indicators for Identifying Hydric Soils in New England", Version 2, July, 1998.***

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 808.06(m) Excessive Information, Wetlands Delineation | **NHWPCA #29w AJ, White Mnt. RMI #49w P,** |
|---|---|---|---|---|---|
| 9-23-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Setbacks for land spreading are included in the regulations to protect both surface water and groundwater quality. With safeguards in place to identify appropriate spreading areas, there is no apparent reason for identifying wetlands outside of the boundaries of land application sites. With hydric soils being identified within the land application site area, and considering setbacks from property boundaries, there is no apparent reason for identifying all wetlands within 250 feet of the land application site. The costs to perform extensive wetland delineations outside of the land application site would be enormous.

**Response:** We have revised the section to clarify our intent.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.06(m) On site wetlands | **P. Adams #33w N,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Add: "..all wetlands ***on the site and*** within 250 feet of the site ***boundaries*** delineated.."
REASON: Wetlands can exist where soil types are other than hydric and can appear after soil maps were prepared, e.g. caused by beaver dams, road construction, etc. Adding the words "on the site" clarifies the fact that all wetlands on the site as well as those close to the site boundaries require identification. Adding the word "boundaries" clarifies the fact that the site under discussion can cover considerable area

**Response:** We have revised this section to incorporate your suggested language.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.06(m) Change Reference | **BFI #56w CU,** |
| 10-20-98 | rfp | 10-21-98 | gcb | | |

**Comment:** BFI Organics feels this requirement is not practical for two reasons: 1) obtaining access to adjoining properties may not be possible, and; 2) the proposed setbacks already prohibit land application within 100 feet of the property boundary or 125 feet of surface water.

Proposed Alternative: Identification of wetlands should be based on and limited to a review of the municipality's conservation commission's wetlands maps and the DES GIS database.

**Response:** We have revised this section to clarify our intent.

(n) The location of all poorly ***and very poorly*** drained soils.

***(o) The location of the items required in Env-Ws 809.03(b).***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.06(n) Very Poorly Drained Soil Location | **P. Adams #33w O,** |
| 10-13-98 | rfp | 10-21-98 | gcb | | |

**Comment:** Add: "..the location of all ***very poorly drained*** and poorly drained soils."
REASON: Very poorly drained soil locations are as important, if not more important, than locations of poorly drained soils.
**Response:** We have revised this section to incorporate your suggested language.

End-Ws 808.07 Management Plans. Management plans required under End-Ws 808.01(c)(3) shall include the following:

(a) The normal hours of operation of the site;

(b) Storage or stockpiling provisions, if applicable;

~~(c) For lagoon disposal sites, a copy of the groundwater permit or application to obtain the permit;~~

(~~d~~c) The ~~anticipated source of material~~ ***name of the generator(s) and its corresponding sludge quality certification numbers, if applicable***;

(e***d***) The quantity of sludge, in ***wet and*** dry tons, , expected on a periodic basis, such as daily, weekly or monthly;

(f***e***) The quantity of sludge, in ***wet and*** dry tons, , expected over the entire life expectancy of the facility, if applicable;

~~(g) The type of treatment used for pathogen reduction and vector attraction reduction, if applicable, required by 40 CFR Part 503;~~

(~~h~~***f***) Additional on-site measures to be taken to control vectors;

(~~i~~***g***) A detailed odor control plan explaining:

(1) The procedures that ~~will~~ ***shall*** be used to address and resolve any odor complaints;

(2) Additional management techniques employed to minimize odors; and

(3) The name, address, and telephone number of the person(s) who ~~will~~ ***shall*** be responsible for responding to odor complaints.

~~Env-Ws 808.01 (12)~~ ***(h)*** A copy of the facility contingency plan describing course(s) of action to

be followed in case of emergency or other special conditions, such as:

~~a.~~*(1)* Equipment breakdowns;

~~b.~~*(2)* Fire;

~~c.~~*(3)* Vectors;

~~d.~~(4) Explosion;

~~e.~~*(5)* Spills;

~~f.~~*(6)* Receipt or release of hazardous or toxic materials or substances;

~~g.~~*(7)* Groundwater, surface water, or air contamination attributable to a facility; and

~~h.~~*(8)* Other incidents that could threaten human health or safety or the environment;

End-Ws 808.08 Facility Standards.

(a) Facilities for the treatment or processing of sludge, ***such as sludge treatment facilities and sludge lagoons,*** shall be designed and constructed in accordance with the requirements of the Guides for the Design of Wastewater Treatment Works by the New England Interstate Water Pollution Control Commission, dated 1998.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08(a) Inappropriate | **BioGro #44w BB**, |
| 10-5-98 | rfp | 11-9-98 | gcb | | |

**Comment:** These design standards are not applicable nor appropriate to all facilities which process biosolids. For example, there are many smaller mobile units which require facility permits such as the mobile BIO*FIX® processing unit or the BIO-MIX soil processing unit are not covered in the manual. All facility plans for construction must be stamped by a licensed New Hampshire Professional Engineer which will ensure that quality engineering standards are being followed in the development of the facility. **As this is an unnecessary requirement, this section should be deleted.**

**Response:** We have revised this section to clarify our intent.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08(a) Applicability | **BFI #56w CV**, |
| 10-20-98 | rfp | | | | |

**Comment: General Comment: Many of the requirements found in the Guide for the Design of Wastewater Treatment Works by the New England Interstate Water Pollution Control Commission, dated 1998 are not applicable to the construction and operation of sludge processing facilities.**

**Response:**

***(b) Sludge composting facilities and sludge monofills shall be designed, constructed, operated and closed in accordance with the requirements of Env-Wm 2300 and Env-Wm 2500, respectively, of the solid waste rules.***

(b) All facilities shall be:

(1) Operated in such a manner so as to ~~have the least~~***minimize the*** impact on abutters and the surrounding community***;***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08(b)(1) Subjective | **NHWPCA #29w AK, BFI #56w CW,** |
| 9-23/10-20-98 | rfp | 11-9-98 | gcb | | |

**Comment:** This requirement is very subjective and should be deleted or reworded. As written, this requirement could easily be used to shut down composting or other biosolids recycling operations without legitimate cause.

**General Comment: What's the definition of "least impact"? This is such a subjective, general and ambiguous statement that it is susceptible of multiple interpretations and is not specific enough to be capable of uniform enforcement. It should be deleted.**

**Proposed Language: Delete End-Ws 808.08 (b)(1).**

**Response:** We have revised the section to address your comments.

(2) Posted with "~~No Trespassing~~***Sludge Management Area. Enter at your own risk.***" signs ~~no more than 100 feet apart~~. ***Such signs shall be printed with block letters no less than 2 inches in height, and with the name and address of the owner or lessee of the property. Such signs shall be posted no more than 100 yards apart on all sides and shall also be posted at gates, bars, and commonly used entrances*** ~~along the perimeter of the property unless the property is fenced~~;

(3) ***Managed to r***estricted from access by the installation of a locked gate or cable;

(4) Operated such that odors from the facility are minimized;

(5) Maintained in a clean and orderly fashion to minimize attraction ~~to~~ ***of*** vectors; and

(6) Closed in accordance with End*v* -*Ws* 808.09.

(c) ***In addition to the requirements in (b) above, a***ll lagoons shall be:

~~(1) Maintained in such a manner to avoid inhibiting proper operation;~~

(~~2~~*1*) Fenced around the perimeter to control access;

(~~3~~*2*) Maintained to provide a minimum of 2 feet of freeboard at all times; ***and***

(***4****5*) Bermed on all sides to divert surface drainage away from the lagoons~~;~~.

~~(5) In compliance with the applicable dam construction and maintenance rules, currently End-Ws 100-800; and~~

~~(6) In compliance with the applicable groundwater rules, currently End-Ws 410~~.

~~(d) Sludge storage and processing.~~

~~(1)The storage or processing of sludge, sludge mixtures, or sludge products excluding lagoons, shall be conducted on an impermeable surface with leachate collection and control of surface water run-on or run-off ,unless a groundwater permit pursuant to End-Ws 410 has been obtained~~.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08(d)(1) No Minimum Duration | **NHWPCA #29w AL**, |
| 9-23-98 | rfp | 11-9-98 | gcb | | |

**Comment:** As written, this section would require impermeable pads and leachate collection for stockpiles that are located at the facility regardless of the stockpiling time period. In order to be consistent with site stockpiling requirements, this section should apply only to stockpiles that are in place for greater than 8 months.

**Response:** We have revised this section to address your comments.

~~(2) The storage and processing of all industrial sludge, including short paper fiber, at a facility shall:~~

~~a.Be done on a pad with a permeability of at least $10^{-5}$;~~

~~b.Contain permanent berms to collect any leachate; and~~

~~c.Provide for collection and disposal of the leachate.~~

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 808.08(d)(2) Reactive Restrictions | **NHWPCA #29w AM,** |
|---|---|---|---|---|---|
| 9-23-98 | rfp | 11-9-98 | gcb | | |

**Comment:** These requirements for industrial sludge stockpiling appear to be a response by the DES to volatile organic compound (VOC) detections around a massive stockpile of short paper fiber at a landfill closure project in southern New Hampshire. The VOCs detected in this case are generated during the decomposition of organic matter under anaerobic conditions. The impact at this one site would be expected at any site, with many types of organic matter (not just industrial sludges) given the same type of stockpile management. Adhering to good management practices and proper stockpile siting would address environmental concerns more effectively than requiring low permeability pads and leachate collection. As with the groundwater permit requirement, this stockpiling requirement would eliminate all but the largest industrial sludge recycling sites. In addition to paper mill residuals, this requirement would affect sludges from food processing, beer making or any sludge not produced by municipal wastewater treatment plants. NHWPCA recommends that the stockpiling of industrial sludge adhere to the following Best Management Practices:

Stockpiles will not exceed 12 feet in height.

Stockpiles will be shaped to facilitate surface water drainage

Stockpiles will not exceed 1000 cubic yards in volume.

Stockpiles will not be ramped or driven on by construction equipment

**Response:** We have revised the section to address your comment.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08(d) Permeability | **BFI #56w CX,** |
| 10-20-98 | rfp | 11-9-98 | gcb | | |

**Comment:** Additional Wording: ...End-Ws 410 has been obtained. The impermeable surface shall:

a. Have permeability of at least $10^{-5}$ centimeters per second;

b. Be constructed with berms to collect any leachate; and

c. Include provisions for the collection and appropriate disposition of the leachate.

(2) The storage and processing of all industrial sludge, including short paper fiber, at a facility shall:

a. Be done on a pad with a permeability of at least $10^{-5}$ centimeters per second;

b. Contain permanent berms to collect any leachate; and

c. Provide for collection and disposal of the leachate.

**General Comment: Permeability should be stated as "no greater than $10^{-5}$ centimeters per second". The rule should also not make a distinction between industrial and municipal sludges.**

**What is meant by "permanent berms"? If the facility is removed at the conclusion of the project, the berms may require removal. "Disposal" should be replaced with "appropriate disposition".**

**Response:** we have revised this section to address your comment.

(e*d*) Subject to (g*f*) below, no person shall site or operate a facility within the buffer distances specified in Table 808-I~~, subject to the notes in (f) below~~:

Table 808-I
Buffer Distances (in feet)

For Processing, Stockpiling or Storage Facilities

| | |
|---|---|
| Nearest Well: | 500[a] |
| Surface Water: | 250[b] |
| ~~Non-Tidal Drainage Ditch:~~ | ~~100~~ |
| Surface Drinking Water Source: | 500 |
| Nearest Occupied Dwelling: | 500[bc] |
| Property Line: | 500[a] |
| Groundwater Depth | 4 |
| Bedrock / Restrictive Layer | 4 |

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08 Buffer distances | **Pennichuck #3w A&B,** |
| 8-21-98 | mwr | 9-16-98 | gcb | | |

**Comment:** The buffer distances for **water** treatment sludge facilities should be same as the buffer distances required for the land application of wastewater sludge. However,, the buffer distances for facilities is larger regardless of sludge type. Further, the buffer distance for water treatment sludge lagoon from surface drinking water supplies should be 125 ft or 250 ft depending on whether spreading or storage setbacks are used. Water treatment sludges are unlikely to impact surface water or to cause odor complaints.

**Response:** We believe all lagoons, regardless of what type of sludge they contain, should be setback at least 250 feet as they have the same potential to overflow, leak, etc... Further, if for no other reason than aesthetics, they shouldn't be closer than 250 feet.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08(e) Buffer Distances | **NHWPCA #29w AN,** |
| 9-23-98 | rfp | | | | |

**Comment:** It should be clarified that these buffer distances apply to areas of sludge activity within the facility, not to the entire facility.

**Response:**

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | Table 808-I Wetlands | **Ken Kettenring #42w E,** |
| 10-5-98 | rfp | 10-21-98 | gcb | | |

**Comment:** No setback to wetlands?

Response:

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | Table 808-I Owner's Well | **BFI #56w CY,** |
| 10-20-98 | rfp | 10-21-98 | gcb | | |

**Comment:** **General Comment: BFI Organics is concerned with footnote "a" which stated "...as far as practical...". Oftentimes the nearest well belongs to the property owner, who should be allowed to waive the setback requirement.**

**Response:** No Change

(~~f~~*e*) The following ~~notes~~ shall apply to Table 808-I:

(1) ***The letter*** "a" means ***that the distance to the nearest well or property line shall be*** as far as practical, but in no case closer than 500 feet.

(2) ***The letter*** "~~b~~*bc*" means ***that the distance to the nearest occupied dwelling shall be*** as far as practical beyond 500 feet, but can be reduced below 500 feet with the occupant's prior written consent.

(~~g~~*f*) Facilities which ~~have been~~ ***are*** in operation ~~for at least 1 year~~ prior to the adoption of ~~these rules~~ ***the 1999 amendments to the Septage and Sludge Management Rules*** shall comply with the buffer distances, identified in Table 808-I~~, above, for any new activities regulated by these rules,~~ ***within 90 days,*** as applicable.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.08(g) Immediate Compliance | **BFI #56w CZ,** |
| 10-20-98 | rfp | 11-9-98 | gcb | | |

**Comment:** **General Comment: Because materials and structures may require relocation, immediate compliance with the new buffer distances may be impractical.**

**Proposed Alternative: BFI Organics proposes the Department allow at least 180 days for compliance with the new buffer distances.**

**Response:**

End-Ws 808.09 Closure Plans.

(a) All sludge facilities that have not ~~already~~ closed as of the effective date of ~~these rules~~ ***the 1999 amendments to the Septage and Sludge Management Rules*** shall submit a closure plan to the department within 120 days of effective date of ~~these rules~~ ***the amendments***.

(b) The closure plan shall include the following:

(1) The facility identification, including name, mailing address, location, and permit number, if applicable;

(2) A description of the procedures for removing all material from the facility, if applicable, and the intended final disposition of the materials;

***(3) A description of any proposed site work that will be performed to regrade and or revegetate the area;***

(~~3~~*4*) The schedule of closure activities and anticipated closure date; and

(~~4~~*5*) A description of how notification ~~will~~ ***shall*** be given to all users of the facility of the termination of ~~receipt of sludge by~~ ***operation of*** the facility.

~~(c) For lagoon sites:~~

~~(1) The material shall be removed and used or disposed of in accordance with the applicable rules, and the lagoons shall be filled, regraded, and the area vegetated; or~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.09 Solids removal from lagoons | **Pennichuck #3w C**, |
| 8-21-98 | mwr | | | | |

**Comment:** Closure of a water treatment sludge lagoon should not require removal of the solids.

**Response:** Closure does not necessarily mean that the solids must be removed from the lagoon. As the rule is presently written, (2) below allows for the lagoon to be closed in place(i.e. the solids remain in the lagoon).

~~(2) Closure must be in accordance with 40 CFR Part 503, Sub-part C.~~

~~(d) A completed closure plan shall be acted on by the department within 90 days of receipt.~~

(e*c*) At least 60 days prior to the planned cessation of facility operations ~~at a facility which has an approved closure plan on file with the department~~, the permittee shall provide the department ***and the municipality in which the facility is located,*** with written notice of the intent to close the facility.

(~~f~~*d*) The notice shall include the following:

(1) The facility identification, including permit number;

(2) The date the facility intends to stop receiving and/or processing sludge;

(3) A copy of the facility's approved closure plan or file reference thereto; and

(4) The date the facility intends to begin closure activities and estimated closure completion date.

(~~g~~*h*) The permittee shall notify the department ***and the municipality in which the facility is located*** when closure is complete.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 808.09(h) Notify Municipalities | **P. Adams #33w P,** |
|---|---|---|---|---|---|
| 10-13-98 | rfp | 10-13-98 | gcb | | |

**Comment:** Add: ***(h) Municipalities will be notified when closures are (1) initiated, and (2) completed.***
REASON: Municipalities need to know.

**Response:** We have revised the section to address your comment.

End-Ws 808.10 Testing.

~~*(a) The results of all testing required in 40 CFR Part 503.16 and 40 CFR Part 503.26 shall be submitted to the department within 30 days after analyses are completed.*~~

***(a) One soil test pit or auger boring shall be taken, at a depth of at least 40 inches, for each soil mapping unit present on the natural resource conservation service county soils map, but no less than one every 5 acres.***

***(b) One soil test or auger boring shall be taken, at a depth of at least 6 feet, for each area proposed for storage.***

***(c) An analysis of the soil test pits or auger borings shown in (b) and (c) above shall be performed and shall include a description of the soil profile characteristics, depth to the seasonal high water table, bedrock, or other restrictive layer.***

End-Ws 808.11 Recordkeeping.

(a) Every facility permit holder shall maintain records of each load of sludge received at the facility, including identification of:

(1) The date received;

(2) The hauler delivering the load;

(3) The quantity of each load of sludge received by the generator, in ~~dry~~ ***wet*** tons and percent solids; ***and***

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.11(a)(3) Dry Tons | **BFI #56w DA,** |
| 10-20-98 | rfp | 11-9-98 | gcb | | |

**Comment:** **General Comment: Calculation of dry tons at the time of pickup is not always practical since many waste water treatment facilities have neither a laboratory nor the staff to perform the analysis and calculations to determine the dry tonnage. Using wet tons for the reporting and the calculation of state management fees will encourage generators to optimize the dewatering capabilities of their waste water treatment facility, thereby reducing the total amount of waste being produced.**

**Response:** we have revised this section to address your comment.

(4) The sludge quality certification number; .

~~(5) The disposition of the material;. and~~

~~(6) The cumulative metals loading for the site.~~

(b) Facility plans, management plans, closure plans, and records shall be maintained by the permit holder, and shall be available to ***the*** department ~~personnel~~ for review during business hours. If the department believes that violations of RSA 485-A or these rules relative to sludge management have occurred, the department shall require the permit holder to submit copies of all records.

(c) Facility plans, management plans, closure plans, and records shall be maintained for a minimum of ~~3~~***5*** years after closure of the facility.

~~(d) Prior to disposing of any records, the permit holder shall submit a written request to the department for permission to dispose of the records. If the department determines that no enforcement actions are pending or contemplated for which the records are or would be necessary, the department shall authorize the permit holder to dispose of the records.~~

End-Ws 808.12 Reporting.

(a) The permit holder shall report all complaints. Information shall be provided to the department orally within 24 hours of receipt of a complaint. A written submission shall be provided within 5 days of the complaint and shall contain a description of the complaint, including exact dates, times, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the concern.~~The department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.~~

(b) Every facility permit holder shall submit an annual report for each facility to the department by the last business day of January for each calendar year in which the permit is valid, regardless of whether or not the facility received or processed sludge during the previous calendar year.

(c) The annual report shall contain the following information:

(1) The name and address of the facility;

(2) The permit number;

(3) The name of the permit holder;

(4) The total quantity of sludge, in ***wet and*** dry tons, ~~of sludge~~ received at the facility, from each generator and their sludge quality certification number; and

(5) The ~~disposition~~ ***quantity*** of all material ~~that was received~~ ***distributed, in wet and dry tons***; ~~for example, the total quantity, in dry~~***wet*** ~~tons, delivered to permitted land application sites, or total volume processed or treated.~~

~~(d) The permit holder shall submit the annual fee specified in End-Ws 808.04 with the annual report, if applicable.~~

(e***d***) If any of the information differs from that previously supplied to the department concerning the activity, the permit holder shall note those differences in the annual report.

~~(f) If any required annual report or annual fee is not submitted to the department by the last business day in January, the department shall proceed in accordance with End-Ws 804.05 to suspend or revoke the permit.~~

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 808.12(f) Reporting | **Legislative Services #23w**, |
| 8-25-98 | rfp | 9-16-98 | gcb | | |

**Comment:** Pursuant to End-Ws 804.05(f), good cause to suspend means that emergency action is necessary to protect public health, safety or welfare. The failure to file a report or fee by the required annual deadline does not appear to warrant emergency action.

**Response:** We have removed this section.

## *PART ENV-WS 809 GROUNDWATER MONITORING*

### *Env-Ws 809.01 Groundwater Monitoring Plan.*

***(a) Groundwater shall be monitored at the following:***

***(1) Sludge monofills;***

***(2) Sludge lagoons;***

***(3) Reclamation Sites; and***

*(4) Those sludge management activities for which engineered controls are not sufficient to protect public health and the environment.*

*(b) The applicant shall propose a groundwater monitoring plan which includes, but is not limited to, monitoring for the constituents listed in Table 809-I, for the life of the site or facility, including the closure, and the post-closure period. The department shall delete any of the parameters required to be monitored for a site or facility, if the permit holder demonstrates that the constituents are not contained in the sludge or other materials managed at the site or facility.*

*(c) The applicant shall establish background concentrations of all constituents required for monitoring. Background concentrations are concentrations detected in areas unaffected by the site or facility permitted or to be permitted.*

*(d) Subject to (f) below, if the concentration of any monitored constituent is above the background value at any downgradient monitoring well, the permit holder shall notify the department within 10 days and shall conduct additional monthly monitoring for each constituent which is above the background value, at each monitoring well for which the concentration of the constituent is above the background value.*

*(e) Subject to (f) below, if the concentration of the constituent(s) detected by the additional monitoring is above the background value for two consecutive months, but is below the ambient groundwater quality standard, the permit holder shall notify the department within 10 days and shall develop a corrective action plan;*

*(f) For nitrate monitored at reclamation sites, the action level in (d) and (e) above shall be 5 mg/l;*

*(g) The corrective action plan shall be submitted to the department within 30 days of the notification required in (e) above and shall identify the various alternatives that would prevent the discharge of the regulated contaminant to groundwater including, but not limited to:*

*1. The inspection and audit of activities and procedures at the site or facility to determine possible sources of contamination;*

*2. The remediation of the source of the groundwater contamination;*

*3. Further groundwater investigation;*

*4. Modification of facility operation or site management;*

*5. Treatment of the waste stream;*

*6. Groundwater restoration; and*

*7. Site or facility closure;*

(h) *The department shall approve the corrective action plan if the plan demonstrates that the action shall:*

*1. Achieve compliance with background and ambient groundwater quality standards;*

*2. Eliminate any future discharges of regulated contaminants to the groundwater; and*

*3. Protect human health and the environment;*

*(i) The corrective action plan shall be initiated within 30 days of department approval and implemented in accordance with an approved implementation schedule;*

*(j) If sampling and analysis at specific wells indicate concentrations of all regulated contaminants in the assessment monitoring are at or below background values, for two consecutive sampling events, the permit holder shall notify the department of this finding and return to the original monitoring scheduled at those wells; and*

*(k) If the concentrations of any regulated contaminant detected by assessment monitoring are above the ambient groundwater quality standard, the permit holder shall notify the department within 10 days and apply for a groundwater management permit.*

*Env-Ws 809.02 <u>Groundwater Monitoring Plan Requirements.</u>*

*(a) The following information shall be included in the groundwater monitoring plan:*

*(1) A detailed proposal for a water quality monitoring program, including proposed monitoring schedule, parameters to be analyzed, and monitoring locations, with supporting information justifying the locations, frequency, and parameters selected;*

*(b) The following shall be included on the site or facility plan prepared in accordance with Env-Ws 806.06 and Env-Ws 808.06 respectively:*

*(1) The location, elevation, and datum of a bench mark.*

*(2) Ground surface spot elevations and contours to show topography;*

*(3) The location of the existing and proposed groundwater monitoring wells ;*

*(4) The location of the surface water sampling points;*

*(5) Groundwater contours which accurately show groundwater flow direction ;*

*(6) Piezometers or other methods used to develop groundwater contours;*

*(7) A table of water level measurements and elevations found in piezometers and monitoring wells used to develop the groundwater contours;*

*(8) Well construction details of monitoring wells, top of well casing elevations, and measured depth to water table from top of casing;*

*Env-Ws 809.03 Water Quality Sampling, Analysis, and Reporting.*

*(a) Groundwater quality shall be monitored semi-annually at all sites and facilities listed in Env-Ws 809.01 to ensure that groundwater quality is in compliance with the terms of the groundwater monitoring plan.*

*(b) At least one hydraulically upgradient and 2 hydraulically downgradient groundwater monitoring wells shall be installed to monitor ambient groundwater quality.*

*(c) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices shall be operated and maintained throughout the life of the monitoring program.*

*(d) The parameters to be monitored shall be determined by the department depending on the regulated contaminants present in the sludge or other materials used in the permitted activity.*

*(e) Location of sampling points shall be approved by the department depending on the hydrogeologic characteristics of the site, predicted rates of groundwater flow, and treatment methods employed.*

*(f) Analyses shall be performed by a laboratory certified by the USEPA or the New Hampshire Department of Environmental Services pursuant to Env-C 300.*

*(g) Sampling shall be performed in accordance with:*

*(1) Sampling procedures and protocol described in "Practical Guide for Ground-Water Sampling," document identification number EPA/600/2-85/104, USEPA; and*

*(2) "RCRA Ground-Water Monitoring Enforcement Guidance," document identification number PB87107751, USEPA.*

*Env-Ws 809.04 Groundwater Monitoring Wells.*

*(a) Unless alternative methods are approved by the department, monitoring wells shall be designed, installed, and decommissioned in accordance with the practices described in:*

*(1) "Standard Practices for Design and Installation of Ground Water Monitoring Wells in Aquifers," American Society for Testing and Materials, Designation: D 5092 - 90, approved June 29, 1990, and published October 1990, readopted - 1995; and*

*(2) "Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells," document identification number EPA/600/4-89/034, USEPA, March, 1991.*

*(b) Monitoring wells shall be:*

*(1) Developed prior to sampling; and*

*(2) Allowed to equilibrate a minimum of 2 weeks prior to sampling.*

**PART End-Ws ~~809~~*10* REQUIREMENTS FOR WAIVERS**

End-Ws 8*1*09.01 Requirements for Waivers.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 809.01 Waivers | **Citizens #1w R**, |
| 8-20/9-25-98 | mwr/rfp | 9-18-98 | gcb | | |

**Comment:** Waivers to the regulations should not be allowed. Allowing waivers counteract many of the improvements in other sections of the new rules.

**Response:** The criteria for granting a waiver require "that the alternatives proposed are at least equivalent to the requirements contained in this rule, that they are adequate to ensure that the provisions of RSA 485-A and RSA 485-C are met, and that human health and the environment be protected." This waiver language is more or less standard in rules throughout the department.

| Date of Entry | | Date of Response | | Rule Reference | Source of Comment |
|---|---|---|---|---|---|
| date | initials | date | initials | 809 Waivers | **MMSD #57w B**, |
| 10-21-98 | rfp | | | | |

**Comment:** Requirements for Waivers, recognizes that strict compliance with all rules may not "fit" every conceivable situation. Under Part 809, the Milorganite® would be entitled to a waiver from duplicate application and permit requirements because current *de facto* reciprocity does in fact provide an equivalent level of over-protection of human health and the environment from reasonably anticipated adverse affects from Milorganite® use consistent with N.H. Rev. Stat. Ann., Chapter 485-A, specifically Part 485-A:4XVL-a(16)(Sludge Disposal), or Chapter 485-C(Groundwater Protection).

If, as indicated, there is agreement that the Part 807 Certification Requirements "do not fit" the situation of ongoing Milorganite® sale and distribution, then the plain language needs to be clarified on *Purpose* and *Applicability*.

**Response:**

(a) The rules contained in this part are intended to apply to a variety of conditions and circumstances. It is recognized that strict compliance with all rules ~~may~~ ***might*** not fit every conceivable situation.

(b) Requests for waivers shall be submitted in writing to the department. ~~and~~

***(c) Requests for waivers*** shall include the following information:

(1) The name, address, and telephone number of the person requesting the waiver;

(2) The ~~location of the facility or site~~ ***permit or sludge quality certification*** to which the waiver request relates, and its ~~site of facility~~ permit ***or certification*** number, if applicable;

(3) A specific reference to the section of the rule for which a waiver is being sought and an explanation of why a waiver is necessary;

(4) A***n*** explanation of the alternatives for which a waiver is sought, with ~~back ups~~***supporting*** data ~~for support~~; and

(5) A full explanation of how the alternatives for which a waiver sought:

a. Are consistent with the intent of RSA 485-A and RSA 485-C; and

b. Would provide an equivalent level of protection of human health and the environment.

(~~b~~***d***) The department shall approve a request for a waiver upon finding that the alternatives proposed are at least equivalent to the requirements contained in ~~this~~***these*** rule***s***, that they are adequate to ensure that the provisions of RSA 485-A and RSA 485-C are met, and that human health***, safety,*** and the environment ~~will~~ ***shall*** be protected.

| Date of Entry | Date of Response | Rule Reference | Source of Comment |
|---|---|---|---|

| date | initials | date | initials | 809.01(b) Equivalency | **BFI #56w DB,** |
|---|---|---|---|---|---|
| 10-20-98 | rfp | | | | |

**Comment:** (~~b~~c) The department shall approve a request for a waiver upon finding that the alternatives proposed are ~~at least equivalent to the requirements contained in this rule, that they are~~ adequate to ensure ~~that the provisions of RSA 485-A and RSA 485-C are met, and~~ that human health and the environment will be protected.

**General Comment: Because each site or facility is unique, equivalency is not an appropriate criteria for determining whether a waiver should be granted. The sole factor should be whether the alternative is adequate to protect human health and the environment.**

**Response:**

(e*e*) No waiver shall be granted which, in the judgment of the department, contravenes the intent of any statute or rule.

(~~d~~*f*) The department shall issue a written response to a request for a waiver within 90 days of receipt of the request ~~or in accordance with the time frames specified in Env-Ws 803.04, if a waiver is requested as part of a new permit application~~.

***Env-Ws 810.02 Label Requirements.***

***(a) The generator of Class A sludge shall submit to the department with the application for a Sludge Quality Certification, and annually with the annual report required under Env-Ws 807.06, a proposed label which includes the following:***

***(1) The name, address, and telephone number of the generator;***

***(2) A brief description of the product, including the process employed to treat or stabilize the sludge;***

***(3) Recommended uses and appropriate application rates;***

***(4) The land application requirements under 810.01 and any other recommended best management practices;***

***(5) Average nutrient analysis for nitrogen, phosphorus, and potassium based upon the analytical results required under Env-Ws 807.05(e) from the previous year;***

***(6) Average metals concentration for the ten metals listed in Env-Ws 807.03(c) based upon the analytical results required under Env-Ws 807.05(e) from the previous year; and***

***(7) If the sludge is not certified as low metals sludge, the annual application limit***

209

***in wet tons per acre and wet pounds per 1000 square feet based on an annual limit of 8 dry tons per acre.***

***(b) The department shall approve the label within 30 days of receipt, if it determines that the information in the proposed label is complete and correct.***

***(c) The generator shall record the name and address of all persons receiving at one time more than 20 cubic yards of sludge.***

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# Voting Sheets

OTP w/ Amendment

Moratorium

Till June 30 2001

| | | |
|---|---|---|
| Wheeler | Y | |
| Russman | Y | 3-2 |
| Below | Y | |
| Krueger | N | |
| Eaton | N | |

OA By Wheeler

SB 218-FN-L

# Committee Report

Date: January 24,1999 Time:

The Senate Committee on Environment held its hearing in Room LOB104, Concord, New Hampshire.

**BILL NO.:** SB218-FN-L TITLE: regulating the land application of sewage sludge.

Members of the Committee present: Senator Russman
Senator Below
Senator Eaton
Senator Krueger
Senator Wheeler

Those appearing in favor:

| Name and Address | Representing |
|---|---|
| See Attached. | |

Those appearing in opposition:

| Name and Address | Representing |
|---|---|
| See Attached. | |

**REPORT OF THE COMMITTEE:**

- ☐ Ought to Pass
- ☒ Ought to Pass w/ Amendment
- ☐ Inexpedient to Legislate
- ☐ Rereferred
- ☐ Interim Study
- ☐ Continued Hearing
- ☐ Postponed Hearing

# STATE OF NEW HAMPSHIRE

# SENATE

# REPORT OF THE COMMITTEE

Date: January 24,1999

THE COMMITTEE ON Environment

to which was referred Senate Bill 218-FN-L

AN ACT regulating the land application of sewage sludge.

VOTE: 3-2

2000-3163s

Having considered the same, report the same with the following amendment and recommend that the bill: **AS AMENDED OUGHT TO PASS.**

Senator Katie Wheeler
For the Committee

Date: April 1,1999 Time: 1:30pm

The Senate Committee on Environment held its hearing in Room LOB306-308, Concord, New Hampshire.

**BILL NO.:** SB218-FN-L TITLE: regulating the land application of sewage sludge.

Members of the Committee present:

Senator Russman
Senator Cohen
Senator Below
Senator D'Allesandro
Senator Johnson
Senator Krueger
Senator Pignatelli
Senator Wheeler

Those appearing in favor:

| Name and Address | Representing |
|---|---|
| See Attached. | |

Those appearing in opposition:

| Name and Address | Representing |
|---|---|
| See Attached. | |

**REPORT OF THE COMMITTEE:**

- ☐ Ought to Pass
- ☒ Ought to Pass w/ Amendment
- ☒ Inexpedient to Legislate
- ☐ Interim Study
- ☐ Continued Hearing
- ☐ Postponed Hearing

☐ Rereferred

# STATE OF NEW HAMPSHIRE

# SENATE

# REPORT OF THE COMMITTEE

Date: May17,1999

THE COMMITTEE ON Environment

to which was referred Senate Bill 218-FN-LOCAL

AN ACT regulating the land application of sewage sludge.

VOTE: 4-4 (split vote)

1999-1299s

Having considered the same, report the same with the following amendment and recommend that the bill: **AS AMENDED OUGHT TO PASS.**

Senator Katie Wheeler
For the Committee

# STATE OF NEW HAMPSHIRE

# SENATE

# REPORT OF THE COMMITTEE

Date: May17,1999

THE COMMITTEE ON Environment

to which was referred Senate Bill 218-FN-LOCAL

AN ACT regulating the land application of sewage sludge.

VOTE: 4-4 (Split Vote)

1999-1299s

Having considered the same, report the same with the following resolution:
Resolved, that it is: **INEXPEDIENT TO LEGISLATE.**

Senator Patricia Krueger
For the Committee