Dinsmore&Shohl LLP
ATTORNEYS

Kevin P. Braig
937-449-6456
kevin.braig@dinslaw.com

March 7, 2008

VIA FEDERAL EXPRESS

Sonja Brooks-Woodard
Regional Hearing Clerk
U.S Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: *In the Matter Logan County Water Pollution Control, Indian Lake District*
Docket No. CWA-05-2007-0004

Dear Sonja:

Enclosed please find an original and one copy of Respondent Logan County Water Pollution Control District's Pre-Hearing Exchange.

As always, if you have any questions relating to this matter, please do not hesitate to contact me.

Very truly yours,

Kevin P. Braig

KPB/las 63926.1
Enclosures

cc: Judge William B. Moran *(with enclosure - via Federal Express)*
Diana L. Embil *(with enclosure - via Federal Express)*

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE ADMINISTRATOR

In the Matter	)	**Docket No. CWA-05-2007-0004**
Logan County Water Pollution	)	
Control, Indian Lake District	)	**Judge William B. Moran**
1015 Orchard Island Road South,	)	
Russells Point, Ohio.	)	

RESPONDENT LOGAN COUNTY WATER POLLUTION CONTROL DISTICT'S PRE-HEARING EXCHANGE

Pursuant to the Pre-Hearing Order dated December 12, 2007, the agreement of the parties, and 40 C.F.R. 22.19, Respondent Logan County Water Pollution Control, Indian Lake District ("ILWPCD"), hereby respectfully provides the following information:

I. INTRODUCTION

The ILWPCD is a small, financially challenged public sewer authority that serves approximately 6,882 households in Logan County, Ohio. Between April 17, 2002 and June 30, 2003, the ILWPCD land-applied 242.3 tons of dry bio-solids to property that the POTW owned and operated. The ILWPCD's application did not harm or threaten public health or the environment.

This case resembles the case of In re City of Marshall, U.S. EPA Docket No. CWA-5-9-013 (October 2, 2000), except that in this case the ILWPCD land-applied far less bio-solids (242.3 dry tons) than the City of Marshall land-applied (1 million gallons) and the ILWPCD's bio-solids were dry, not wet. In the City of Marshall case, the Administrative Law Judge assessed a $12,000 penalty. The penalty in this case, if any, should not exceed the $12,000 assessed in City of Marshall. In addition, the imposition of a penalty, if any, should be guided by the U.S. EPA's National Municipal Litigation Consideration.

II. INFORMATION

A. ILWPCD Witnesses

1. Ron Jacob - ILWPCD Operations Manager

Mr. Jacob will testify that as to the operations of the Indian Lake POTW and his voluntarily and self-reporting that the POTW land-applied approximately 242.3 tons of dry bio-solids during 12 months from April 17, 2002 through June 30, 2003. Mr. Jacob will testify that the POTW voluntarily reported this land-application to the U.S. EPA and voluntarily ceased the land application prior to the U.S. EPA taking any action on the matter.

Mr. Jacob will testify that the POTW's land application complied with the Part 503 regulations relating to volatile reduction/vector attraction and agronomic rate. Mr. Jacob will testify that the ILWPCD's volatile reduction tests understated the amount of volatile reduction contained in its test reports. Mr. Jacob will testify that the POTW has no history of Section 503 violations and has not violated any section 503 requirements since terminating land application in June of 2003. Mr. Jacob will testify as to the Ohio EPA's approval of the ILWPCD's handling and land-application of bio-solids in 1996 and 1997 and the ILWPCD's land application reporting to the Ohio EPA. Mr. Jacob will testify that the ILWPCD's land application did cause or threaten to cause harm to the environment or the public health.

Mr. Jacob will testify that the ILWPCD is making large expenditures to upgrade its POTW, including but not limited to spending approximately $280,000 to construct a septage receiving station that will receive bio-solids from private handlers in the Logan County area.

2. Garis Pugh - General Manager

Mr. Pugh will testify regarding the demographics of the ILWPCD service area and the financial burden that a major financial penalty would impose upon the ILWPCD and its users. Mr. Pugh will testify that raising user fees to pay a penalty is not an option because many of the ILWPCD's users live below the poverty line.

Mr. Pugh will testify that the ILWPCD reported its land application to the Ohio EPA in 2002-2003 and that the Ohio EPA never objected to the ILWPCD's land application. Mr. Pugh will testify as to the ILWPCD's hiring of Ron Jacob and awards that Mr. Jacob has received from the Water Management Association of Ohio for his work in planning a bio-solids handling facility.

Mr. Pugh will testify that the ILWPCD is making large expenditures to upgrade its POTW, including but not limited to spending approximately $280,000 to construct a septage receiving station that will receive bio-solids from private handlers in the Logan County area.

3. Tom Menke - Menke Consulting

Mr. Menke is an expert on agriculture and the handling of wastes such as animal manure and bio-solids. Mr. Menke will testify that the ILWPCD's land application of bio-solids complied with the U.S. EPA's agronomic rate requirements and that the land application did not harm or threaten to harm the environment or public health. A copy of Mr. Menke's resume is attached hereto as Exhibit 38.

4. Jack Webb - Indian Lake Watershed Project

Mr. Webb is the executive director of the Indian Lake Watershed Project, a non-profit entity whose mission is to protect and conserve the water quality of Indian Lake, a 5500-acre lake within the ILWPCD's service district. Mr. Webb will testify as to the critical contributions that the ILWPCD has made over the past 15 years to improving and maintaining water quality in Indian Lake and throughout the watershed.

B. Exhibits

1. Ron Jacob (ILWPCD) Letter to U.S. EPA (2/18/04)
2. Ohio EPA NPDES Inspection Report (9/30/1996)
3. Ohio EPA NPDES Inspection Report (9/29/1997)
4. Ohio EPA NPDES Inspection Report (5/18/2000)
5. Ohio EPA NPDES Inspection Report (3/21/2001)
6. Ohio EPA NPDES Inspection Report (5/16/02)
7. Ohio EPA NPDES Inspection Report (6/19/03)
8. 2002 ILWPCD Annual Sewage Sludge Report to Ohio EPA (1/8/2003)
9. 2004 ILWPCD Annual Sewage Sludge Report to Ohio EPA (1/13/2004)
10. ILWPCD Section 503 Volatile Reduction Data
11. ILWPCD Soil Analysis of Land Application Field (Belmont Labs 12/27/2004)
12. ILWPCD DMRQA Study 21 Special Recognition
13. Water Management Association of Ohio Technician of the Year - Ron Jacob
14. ILWPCD Biosolids Management Plan (4/10/2003)
15. ILWPCD Wastewater Master Plan (2/7/2005)
16. Ohio EPA NPDES Guidance for Monitoring and Reporting for Sewage Sludge (4/15/2005)
17. Ohio EPA Sewage Sludge Use or Disposal in Ohio - CY 2002
18. ILWPCD Customer Base in Equivalent Dwelling Units
19. ILWPCD Customer Base Demographic Data (Russells Point, Ohio)
20. ILWPCD Customer Base Demographic Data (Lakeview, Ohio)
21. ILWPCD Customer Base Demographic Data (Huntsville, Ohio)
22. ILWPCD Customer Base Demographic Data (Stokes Township, Ohio)

23. ILWPCD Customer Base Demographic Data (Richland Township, Ohio)

24. ILWPCD Customer Base Demographic Data (Washington Township, Ohio)

25. City of Marshall, Minnesota Demographic Data

26. City of Salisbury, Maryland Demographic Data

27. ILWPCD O34 Anticpated Funds for Appropriate for 2006

28. Peter Ross (5/3 Securities) Letter to Logan County Auditor (8/15/2006)

29. Squire Sanders Letter to 5/3 Securities (2/9/2006)

30. ILWPCD POTW Improvements - Updated Cost Estimate Comparison (9/18/2006)

31. EPA General Enforcement Policy #GM - 21 (2/16/1984)

32. EPA General Enforcement Policy #GM -22 (2/16/1984)

33. Interim Clean Water Act Settlement Policy (3/1/1995)

34. GAO Report: Environmental Compliance and Enforcement - EPA's Effort to Improve and Make More Consistent Its Compliance and Enforcement Activities (6/28/2006)

35. Daily Environment Reporter, EPA, Regional, State Actions Inconsistent; More Uniformity Needed, Senate Panel Told (6/29/2006).

36. In re City of Marshall, CWA-5-98-013, Initial Decision (10/3/2000)

37. In re City of Marshall, CWA Appeal No. 00-9, Decision and Remand Order (10/31/2001)

38. Tom Menke - Expert Biographical Sketch

39. Inspector General Land Application of Biosolids Status Report (3/28/20)

40. ILWPCD Report on Treatment System Upgrades, Including, Fine Screens, Equalization Basins, UV Disinfection, Belt Filter Press and Septage Receiving Station, Permit to Install # 597728, Logan County

IV. LIABILITY CLARIFICATION

A. Count I - Failure to File Annual Report (Count I)

The ILWPCD denies that it failed to file annual reports relating to its land application of bio-solids for 2002 and 2003. As Respondent's Exhibits 8 and 9 demonstrate, the ILWPCD filed annual reports with the Ohio EPA, although it did not do so with the U.S. EPA.

As Respondent's Exhibit 16 states, Ohio EPA NPDES permits, such as the ILWPCD's NPDES permit, have included Part 503 compliant monitoring stations since 1993. Ohio adopted laws and rules for bio-solids management in 2000 and 2002, respectively. The U.S. EPA formally delegated bio-solids management to the Ohio EPA in 2005.

B. Count II - Failure To Meet Pathogen Reduction Requirements

The ILWPCD admits that it land applied bio-solids during each of 13 months during the period from April 17, 2002 through June 30, 2003 and that it cannot prove at this time that the bio-solids applied during that period complied with the U.S. EPA's pathogen reduction requirements contained in Part 503 of the Code of Federal Regulations.

C. Count III - Failure To Meet Vector Attraction (Volatile Reduction) Requirements

As demonstrated and discussed in Respondent's Exhibit 10, the ILWPCD denies that it violated the U.S. EPA's Part 503 volatile reduction/vector attraction requirements.

D. Count IV - Failure To Meet Agronomic Rate Requirements

The ILWPCD denies that it violated the U.S. EPA's Part 503 agronomic rate requirements.

E. Penalty Assessment

The ILWPCD states that the U.S. EPA's lacks substantial justification for its proposed maximum penalty of $137,500 and that this penalty amount is totally unreasonable and without any basis in fact or law and is grossly disproportional to prior civil penalties assessed against other municipal sewer authorities, such the City of Marshall, MN and the City of Salisbury, MD.

The ILWPCD anticipates that, at the appropriate time, the ILWPCD will seek to recover the attorney fees and expenses it has incurred and will incur in the future in this matter pursuant to the Equal Access to Justice Act, 5 U.S.C. § 504.

V. ABILITY TO PAY DOCUMENTATION

The ILWPCD has included with its exhibits documentation of its financial condition as well as demographic data relating to its service area that demonstrates the financial hardship that it and its customers will suffer if the U.S. EPA's proposed penalty is assessed in this case.

VI. TIME AND PLACE OF HEARING

The ILWPCD would prefer that the hearing take place in Dayton, Ohio at the offices of its counsel Dinsmore & Shohl, LLP in order to save on expense. However, the IWLPCD is prepared to appear and present its case at the location that the Administrative Law Judge determines to be most appropriate.

The ILWPCD anticipates that it will take 1 day to put on its case assuming cross-examination by the U.S. EPA is not unusually lengthy. Currently, the ILWPCD and its counsel are available throughout May (except for the week of May 10-14, 2008) and June to hold this hearing and requests that the specific date be set by mutual agreement in a pre-hearing telephone conference.

Respectfully submitted,

Kevin P. Braig
DINSMORE & SHOHL,LLP
1 Dayton Centre
1 South Main Street - Suite 1300
Dayton, Ohio 45402
PH: 937-449-6456
FAX: 937-449-6405
kevin.braig@dinslaw.com
Counsel for Respondent Logan County
Water Pollution Control District

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Respond Logan County Water Pollution Control District's Pre-Hearing Exchange was sent on this 7th day of March 2008, via Federal Express to the following:

Judge William B. Moran
U.S. Environmental Protection Agency
Office of the Administrative Law Judges
Franklin Court Building
1099 14th Street N.W. Suite 350
Washington, D.C. 20460

Diana L. Embil
Associate Regional Counsel, U.S. EPA, R5
77 West Jackson Boulevard
Chicago, IL 60604-3590
Counsel for U.S. EPA

Sonja Brooks-Woodard
Regional Hearing Clerk
U.S. EPA
77 West Jackson Boulevard
Chicago, IL 60604-3590

Kevin P. Bray
ATTORNEY

Flat Branch District
937-843-2632

Indian Lake District
937-843-3328

Administrative Office
Logan County Water Pollution Control
1015 Orchard Island Rd. South
PO Box 1550, Russells Point, OH 43348
937-843-3669 Fax number

FILE COPY

February 18, 2004

USEPA – Region 5
Water Enforcement and Compliance
Assurance Branch (WC – 15J)
77 West Jackson Blvd.
Chicago, IL 60604-3590

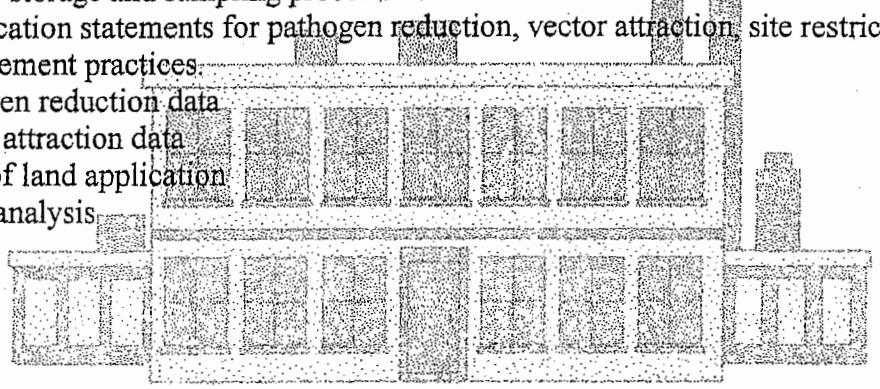
Re: Indian Lake Water Pollution Control Facility 40 CFR 503
Annual Report for Disposal of Biosolids (2003)

Dear Sir/Madam:

In accordance with 40 CFR 503.18(a)(1) reporting requirements, the Indian Lake Water Pollution Control Facility (ILWPCF) submits the following annual report for your review. This report covers the application of biosolids to an Ohio Environmental Protection Agency (OEPA) approved site owned by this facility and located within Logan County.

ILWPCF land applied 52.6 metric tons total of biosolids in the months of February, March, April, May and June of 2003. Accordingly, the minimum frequency of monitoring as required by CFR 503.16 Table No. 1 is once per year. In addition to land application, ILWPC disposed 51.7 metric tons of biosolids to the local landfill from August through December 2003. ILWPCF has recently signed a three year contractual agreement with the local landfill for disposal. Therefore, land application will cease. Attached you will find the following information:

A. USEPA Form 3320 for 2003
B. On site storage and sampling procedures
C. Certification statements for pathogen reduction, vector attraction, site restrictions and management practices.
D. Pathogen reduction data
E. Vector attraction data
F. Dates of land application
G. Metal analysis



DEFENDANT'S EXHIBIT 3

ADDITIONAL ITEMS TO NOTE:

I assumed the position of Operations Manager for the ILPEC facility on December 1, 2003. It is my responsibility to review and submit this annual report with my findings. The following summarizes my findings:

ILWPCF has been disposing of biosolids at the local landfill since August of 2003 and will continue through contractual agreement. As you review the data included in this report, you will notice the facility was not consistently meeting Pathogen and Vector attraction reduction requirements. Failure to meet the requirements prompted and necessitated landfill disposal. For obvious reasons, we cannot sign the certification statements as required for pathogen and Vector reduction. Metal analysis did show we always met Table No. 3 of 40 CFR 503.13 pollutant concentrations. The data also indicates site restrictions and management practices were not consistently met. Consequently, we are unable to certify these practices. A further review of the files uncovered another matter. The past administration failed to file annual reports.

We would like to inform you that all sludge produced and land applied has been on property owned by this facility and is located in a region with no public exposure. Interviews with land application personnel indicate there have never been any problems associated with sludge applied to this site.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

Ronald J. Jacob
Operations Manager

RJJ/dlg

cc: Garis Pugh, ILWPC District Manager
Logan County Commissioners
Ohio Environmental Protection Agency, Div. of Surface Water

NPDES COMPLIANCE INSPECTION REPORT

Section A: National Data System Coding

Permit #	NPDES	Yr/Mo/Day	Inspection Type	Inspector	Fac Type
1PK00002*FD	OH0036641	96/09/30	C	S	1

Section B: Facility Data

Name and Location of Facility Inspected	Entry Time	Permit Effective Date
Indian Lake Water Pollution Control District 1015 Orchard Island Road South Russells Point, OH 43348	9:30 a.m.	October 1, 1996
	Exit Time	**Permit Expiration Date**
	12:00 p.m.	March 31, 2001

Name(s) and Title(s) of On-Site Representative(s)		Phone Number(s)
Thomas Weer	Assist. Mgr./Operations	(513) 843-3328
Cynthia Defibaugh	Assist. Mgr./Administration	

Name, Address and Title of Responsible Official — **Phone Number**

Garis Pugh, District Manager
Indian Lake Water Pollution Control District
1015 Orchard Island road South
Russells Point, OH. 43348

(513) 843-3328

Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S Permit	S Flow Measurement	N Pretreatment
S Records/Reports	N Laboratory	S Compliance Schedules
S Operations & Maintenance	S Effluent/Receiving Waters	S Self-Monitoring Program
S Facility Site Review	S Sludge Storage/Disposal	N Other
S Collection System		

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

DEFENDANT'S EXHIBIT 5A

SEE ATTACHED REPORT.

Joshua B. Jackson — 10/4/96 — Ohio EPA, SWDO
Name(s) and Signature(s) of Inspector(s) — Date — District Office

Martyn G. Burt — 10/7/96 — Ohio EPA, SWDO
Name and Signature of Reviewer — Date — District Office

NPDES COMPLIANCE INSPECTION REPORT

Section A: National Data System Coding

Permit #	NPDES	Yr/Mo/Day	Inspection Type	Inspector	Fac Type
1PK00002*FD	OH0036641	97/09/29	C	S	1

Section B: Facility Data

Name and Location of Facility Inspected	Entry Time	Permit Effective Date
Indian Lake Water Pollution Control District	1:00 p.m.	October 1, 1996
1015 Orchard Island Road South		
Russells Point, OH 43348	**Exit Time**	**Permit Expiration Date**
	3:30 p.m.	March 31, 2001

Name(s) and Title(s) of On-Site Representative(s)	Phone Number(s)
Thomas Weer Assist. Mgr./Operations	(937) 843-3328

Name, Address and Title of Responsible Official	Phone Number
Garis Pugh, District Manager Indian Lake Water Pollution Control District 1015 Orchard Island road South Russells Point, OH. 43348	(937) 843-3328

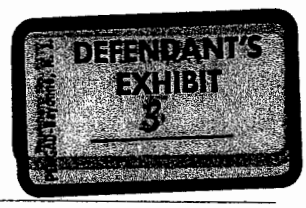
Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S Permit	S Flow Measurement	N Pretreatment
S Records/Reports	S Laboratory	S Compliance Schedules
S Operations & Maintenance	S Effluent/Receiving Waters	S Self-Monitoring Program
S Facility Site Review	S Sludge Storage/Disposal	N Other
S Collection System		

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

SEE ATTACHED REPORT.



Aaron M. Shultz — Aaron M. Shultz — 10/17/97 — Ohio EPA, SWDO

Name(s) and Signature(s) of Inspector(s) — Date — District Office

Martyn G. Burt — Martyn G. Burt — 10/21/97 — Ohio EPA, SWDO

Name and Signature of Reviewer — Date — District Office

NPDES COMPLIANCE INSPECTION REPORT

Section A: National Data System Coding

Permit #	NPDES	Yr/Mo/Day	Inspection Type	Inspector	Fac Type
1PK00002*FD	OH0036641	00/05/18	R	S	1

Section B: Facility Data

Name and Location of Facility Inspected	Entry Time	Permit Effective Date
Indian Lake Water Pollution Control District 1015 Orchard Island Road, South Russells Point, OH 43348	10:30 a.m. **Exit Time** 1:00 p.m.	October 1, 1996 **Permit Expiration Date** March 31, 2001

Name(s) and Title(s) of On-Site Representative(s)		Phone Number(s)
Thomas Weer	Operations, Manager	(937) 843-3328
Don Corwin	Lab. Technician	(937) 843-3328

Name, Address and Title of Responsible Official		Phone Number
Garis Pugh	District Manager	(937) 843-3328

Section C: Areas Evaluated During Inspection
(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S Permit	S Flow Measurement	N Pretreatment
U Records/Reports	U Laboratory	S Compliance Schedules
S Operations & Maintenance	S Effluent/Receiving Waters	S Self-Monitoring Program
U Facility Site Review	N Sludge Storage/Disposal	N Other
N Collection System		

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

See Attachment.

Sandra D. Leibfritz — 6/30/00 — Ohio EPA, SWDO
Name(s) and Signature(s) of Inspector(s) — Date — District Office

Martyn G. Burt — 7/3/00 — Ohio EPA, SWDO
Name and Signature of Reviewer — Date — District Office

NPDES COMPLIANCE INSPECTION REPORT

Section A: National Data System Coding

Permit #	NPDES	Yr/Mo/Day	Inspection Type	Inspector	Fac Type
1PK00002*FD	OH0036641	01/03/21	C	S	1

Section B: Facility Data

Name and Location of Facility Inspected	Entry Time	Permit Effective Date
Indian Lake Water Pollution Control District 1015 Orchard Island Road, South Russells Point, OH 43348	9:30 a.m. Exit Time 11:00 p.m.	October 1, 1996 Permit Expiration Date March 31, 2001

Name(s) and Title(s) of On-Site Representative(s)		Phone Number(s)
Thomas Weer	Operations, Manager	(937) 843-3328
Don Corwin	Lab. Technician	(937) 843-3328

Name, Address and Title of Responsible Official		Phone Number
Garis Pugh	District Manager	(937) 843-3328

Section C: Areas Evaluated During Inspection
(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

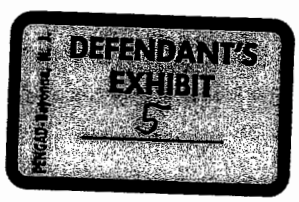
S Permit	S Flow Measurement	N Pretreatment
M Records/Reports	N Laboratory	S Compliance Schedules
S Operations & Maintenance	S Effluent/Receiving Waters	S Self-Monitoring Program
S Facility Site Review	N Sludge Storage/Disposal	N Other
N Collection System		

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

See Attachment.

Sandra D. Leibfritz — 4/02/01 — Ohio EPA, SWDO
Name(s) and Signature(s) of Inspector(s) — Date — District Office

Martyn G. Burt — 4/2/01 — Ohio EPA, SWDO
Name and Signature of Reviewer — Date — District Office



NPDES COMPLIANCE INSPECTION REPORT

Section A: National Data System Coding

Permit #	NPDES	Yr/Mo/Day	Inspection Type	Inspector	Fac Type
1PK00002*GD	OH0036641	02/05/16	R	S	1

Section B: Facility Data

Name and Location of Facility Inspected	Entry Time	Permit Effective Date
	11:00	1 February 02
Indian Lake WPCD 1400 Dye Mill Road Troy, Ohio 45373	**Exit Time** 12:30	**Permit Expiration Date** 31 March 06

Name(s) and Title(s) of On-Site Representative(s) — **Phone Number(s)**
Don Corwin, Lab. Technician — (937)843-3328

Name, Address and Title of Responsible Official — **Phone Number**
Garis Pugh, District Manager — (937) 843-3328

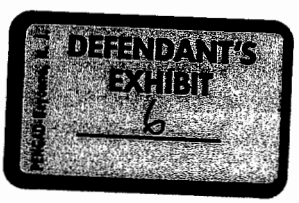
Section C: Areas Evaluated During Inspection
(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S Permit	N Flow Measurement	N Pretreatment
N Records/Reports	N Laboratory	N Compliance Schedules
S Operations & Maintenance	S Effluent/Receiving Waters	N Self-Monitoring Program
S Facility Site Review	N Sludge Storage/Disposal	N Other
N Collection System		

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)
See Attachment.

Sandra D. Leibfritz — 5.30.02
Name(s) and Signature(s) of Inspector(s) — Date — Ohio EPA, SWDO District Office

Martyn G. Burt — 5/30/02
Name and Signature of Reviewer — Date — Ohio EPA, SWDO District Office



NPDES COMPLIANCE INSPECTION REPORT

Section A: National Data System Coding

Permit #	NPDES	Yr/Mo/Day	Inspection Type	Inspector	Fac Type
1PK00002*HD	OH0036641	03/06/19	C	S	1

Section B: Facility Data

Name and Location of Facility Inspected

Indian Lake WPCD
1015 Orchard Island Road South
P.O Box 1550
Russells Point, OH43348

Entry Time: 9:30
Exit Time: 12:40
Permit Effective Date: 1 March 03
Permit Expiration Date: 31 March 06

Name(s) and Title(s) of On-Site Representative(s) — **Phone Number(s)**

Don Corwin, Operator Analyst — (937) 843-3328
Ron Jacob, Operations Manager — (937) 843-3328
Cynthia Defibaugh, Administrative Manager — (937) 843-3328

Name, Address and Title of Responsible Official — **Phone Number**

Garis Pugh, District Manager — (937) 843-3328

Section C: Areas Evaluated During Inspection
(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S Permit	N Flow Measurement	N Pretreatment
S Records/Reports	N Laboratory	S Compliance Schedules
U Operations & Maintenance	U Effluent/Receiving Waters	U Self-Monitoring Program
S Facility Site Review	- Sludge Storage/Disposal	U Other
U Collection System		

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

See Attachment.

Sandra D. Leibfritz — 3/29/04 — Ohio EPA, SWDO
Name(s) and Signature(s) of Inspector(s) — Date — District Office

for — 3/29/04
Martyn G. Burt — Ohio EPA, SWDO
Name and Signature of Reviewer — Date — District Office

DEFENDANT'S EXHIBIT 7

Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

Certification Statement *Please Type*

Facility Name: Indian Lake Water Pollution Control District	Date: 1-8-03
Ohio EPA Permit #: 1PK00002*DD	NPDES Application #: OH 0036641
Mailing Address: P O Box 1550	
City, State, Zip Code: Russels Point, OHio 43348	
Signature of Responsible Official:	

"I certify, under penalty of law, that the information transmitted by this Annual Sludge Report was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

Thomas W. Weer
Signature

Date: 1 / 8 / 03

THOMAS W. WEER
Printed Name

Operation Mgr.
Title

Were you inspected by USEPA last year? ____ Y _X_ N Date: ____ / ____ / ____

Certification statements should be signed in accordance with paragraph 3745-31-04 of the Ohio Administrative Code:

1. In the case of a corporation, by a principal executive officer of at least the level of vice-president, or his duly authorized representative (in writing), if such representative is responsible for the overall operation of the facility;
2. In the case of a partnership, by a general partner;
3. In the case of a sole proprietorship, by the proprietor;
4. In the case of a municipal, state, federal or other government facility, by the principal executive officer, the highest ranking elected official, or the duly authorized employee.

DEFENDANT'S EXHIBIT 8

Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

Table 1: Sewage Sludge Use or Disposal *Please Type*

Facility Name: Indian Lake Water Pollution Control District	Date: 1-9-03
Ohio EPA Permit #: 1PK00002*DD	NPDES Application #: OH 0036641

Values Reported for Calendar Year 2002

	84368 Pathogen Class	84369 Pathogen Alternative	46397 PFRP Option	46396 PSRP Option	84370 VAR Option	70316 Sludge Weight (dry tons)	51129 Biosolids Weight (dry tons)	80991 Sludge Volume (gallons)
Land Application	B	2		3	1	222		
Land Application								
Land Application								
Land Application								
Land Application								
PPG Lime Lakes								
Incineration								
Landfill								
Lagoon								
To Another Facility								

Circle if no sludge removed.

Ohio EPA 4229 (Rev. 07/02)

EXHIBIT 1

Blumberg No. 6119

Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

Table 2 Continued: Sewage Sludge Constituents

Please Type

Facility Name: Indian Lake Water Pollution Control District	Date: 1-8-03
Ohio EPA Permit #: 1PK00002*DD	NPDES Application #: OH 0036641

Values Reported for Calendar Year 2002

		00627 TKN (mg/kg)	00611 NH3-N (mg/kg)	00668 P (mg/kg)	00938 K (mg/kg)	00400 pH (S.U.)	70318 TS (%)	70322 VS (%)	70316 Sludge Wt. (dry tons)
Jan	Max						15	54	
	Avg						15	54	8.2
	Min						15	54	
Feb	Max						20	59	
	Avg						18.5	59	19.5
	Min						17	59	
Mar	Max	42600	8560	18000		7.6	16	58	
	Avg	42600	8560	18000			16	58	10
	Min	42600	8560	18000		7.6	16	58	
Apr	Max								
	Avg								0
	Min								
May	Max						18	53	
	Avg						18	53	2.5
	Min						18	53	
Jun	Max	42300	10600	19500		7.9	17	49	
	Avg	42300	10600	19500			17	49	8.6
	Min	42300	10600	19500		7.9	17	49	
Jul	Max								
	Avg								0
	Min								
Aug	Max	33600	7040	15900		7.6	19	51	
	Avg	33600	7040	15900			18	45	30
	Min	33600	7040	15900		7.6	17	39	
Sep	Max						20	53	
	Avg						18	46	33.7
	Min						16	34	
Oct	Max						19	55	
	Avg						18	47	66.2
	Min						16	33	
Nov	Max						18	47	
	Avg						18	45	33.2
	Min						18	43	
Dec	Max	37200	8220	18500		6.7	18	59	
	Avg	37200	8220	18500			18	59	9.8
	Min	37200	8220	28500		6.7	18	59	
Total	Max	42600	10600	19500		7.9	20	59	
	Avg	38925	8605	17975			17.5	51.5	222
	Min	33600	7040	15900		6.7	15	33	

Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

Table 2: Sewage Sludge Constituents

Please Type

Facility Name: Indian Lake Water Pollution Control District	Date: 1-8-03
Ohio EPA Permit #: 1PK00002*DD	NPDES Application #: OH 0036641

Values Reported for Calendar Year 2002

		01003 As (mg/kg)	01013 Be (mg/kg)	01028 Cd (mg/kg)	01029 Cr (mg/kg)	01043 Cu (mg/kg)	01052 Pb (mg/kg)	01068 Ni (mg/kg)	01093 Zn (mg/kg)	01148 Se (mg/kg)	71921 Hg (mg/kg)	78465 Mo (mg/kg)
Jan	Max											
	Avg											
	Min											
Feb	Max											
	Avg											
	Min											
Mar	Max											
	Avg											
	Min											
Apr	Max											
	Avg											
	Min											
May	Max											
	Avg											
	Min											
Jun	Max											
	Avg	12		3	24	480	44	27	1100	AA	.931	38
	Min											
Jul	Max											
	Avg											
	Min											
Aug	Max											
	Avg											
	Min											
Sep	Max											
	Avg											
	Min											
Ocl	Max											
	Avg											
	Min											
Nov	Max											
	Avg											
	Min											
Dec	Max											
	Avg	AA		AA	31	810	55	28	1500	AA	.78	56
	Min											
Total	Max	12		3	31	810	55	28	1500	AA	.931	56
	Avg	12		3	27.5	645	49.5	27.5	1300	AA	.856	47
	Min	12		3	24	480	44	27	1100	AA	.78	38

Belmont Labs
The Environmental Service Company.

Order # 02-08-765
09/19/02 13:07

TEST RESULTS BY SAMPLE

Sample Description: SOLIDS 08/16 0800 Lab No: 01A
Test Description: DIOXINS AND PCBS Method: 1668 / 1613 Test Code: DI_PCB
Collected: 08/16/02 Category: SOLIDS

PARAMETER	RESULT	LIMIT
TOTAL TCDD	BDL	9.3
TOTAL PeCDD	BDL	689
TOTAL HxCDD	24.0	5.8
TOTAL HpCDD	188	14.4
OCDD	988	28.7
TOTAL TCDF	BDL	2.0
TOTAL PeCDF	BDL	10.1
TOTAL HxCDF	28.6	3.9
TOTAL HpCDF	98.2	9.1
OCDF	105	23.9
2,3,7,8-TCDD	BDL	2.5
2,3,7,8-TCDF	BDL	2.0
1,2,3,7,8-PeCDD	BDL	4.0
1,2,3,7,8-PeCDF	BDL	2.6
2,3,4,7,8-PeCDF	BDL	2.9
1,2,3,4,7,8-HxCDD	BDL	6.1
1,2,3,6,7,8-HxCDD	BDL	5.8
1,2,3,7,8,9-HxCDD	BDL	5.6
1,2,3,4,7,8-HxCDF	BDL	3.3
1,2,3,6,7,8-HxCDF	BDL	3.5
1,2,3,7,8,9-HxCDF	BDL	5.6
2,3,4,6,7,8-HxCDF	BDL	4.1
1,2,3,4,6,7,8-HpCDD	102	14.4
1,2,3,4,6,7,8-HpCDF	55.3	7.1
1,2,3,4,7,8,9-HpCDF	BDL	12.7
3,3',4,4'-TCB	197	15.2
3,4,4',5-TCB	BDL	18.6
3,3',4,4',5-PeCB	BDL	27.2
2,3,3',4,4'-PeCB	1460	27.1
2,3',4,4',5-PeCB	3560	25.7
2',3,4,4',5-PeCB	831	29.1
2,3,4,4',5-PeCB	BDL	27.8
3,3',4,4',5,5'-HxCB	BDL	53.5
2,3,3',4,4',5-HxCB	554	50.1
2,3,3',4,4',5'-HxCB	BDL	50.1
2,3',4,4',5,5'-HxCB	216	48.6

OhioEPA

Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

FILE COPY

Certification Statement

Please Type

Facility Name: Indian Lake Water Pollution Control	Date: 1/13/04
Ohio EPA Permit #: 1PK00002*GD	NPDES Application #: OH0036641
Mailing Address: P.O.Box 1550 Russells Point, Ohio 43348	
City, State, Zip Code: Russells Point, Ohio 43348	
Signature of Responsible Official: Hans E. Pugh	

"I certify, under penalty of law, that the information transmitted by this Annual Sludge Report was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

Hans E Pugh
Signature

Date: 01 / 16 / 04

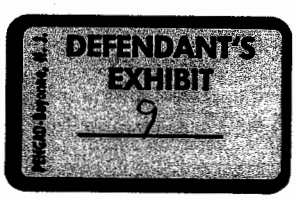
Printed Name

Title

Were you inspected by USEPA last year? ____ Y x N Date: ____ / ____ / ____

Certification statements should be signed in accordance with paragraph 3745-31-04 of the Ohio Administrative Code:

1. In the case of a corporation, by a principal executive officer of at least the level of vice-president, or his duly authorized representative (in writing), if such representative is responsible for the overall operation of the facility;
2. In the case of a partnership, by a general partner;
3. In the case of a sole proprietorship, by the proprietor;
4. In the case of a municipal, state, federal or other government facility, by the principal executive officer, the highest ranking elected official, or the duly authorized employee.



Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

Table 1: Sewage Sludge Use or Disposal *Please Type*

Facility Name: Indian Lake Water Pollution Control	Date: 1/13/04
Ohio EPA Permit #: 1PK00002*GD	NPDES Application #: OH 0036641

Values Reported for Calendar Year 2003

	84368 Pathogen Class	84369 Pathogen Alternative	46397 PFRP Option	46396 PSRP Option	84370 VAR Option	70316 Sludge Weight (dry tons)	51129 Sludge Fee Weight (dry tons)	80991 Sludge Volume (gallons)
Land Application	B	2		3	1	58		
Land Application								
Land Application								
Land Application								
Land Application								
PPG Lime Lakes								
Incineration								
Landfill						57		
Lagoon								
To Another Facility								

Circle if no sludge removed.

Ohio EPA 4229 (Rev. 07/02)

EXHIBIT 2

Blumberg No. 6116

Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

Table 2 Continued: Sewage Sludge Constituents

Please Type

Facility Name:	Date:
Indian Lake Water Pollution Control	01/14/04
Ohio EPA Permit #:	**NPDES Application #: OH**
1PK00002*GD	0036641

Values Reported for Calendar Year 2003

		00627 TKN (mg/kg)	00611 NH_3-N (mg/kg)	00668 P (mg/kg)	00938 K (mg/kg)	00400 pH (S.U.)	70318 TS (%)	70322 VS (%)	70316 Sludge Wt. (dry tons)
Jan	Max								
	Avg								
	Min								
Feb	Max						22	59	
	Avg						17.3	57	8.2
	Min						13	54	
Mar	Max	55200	7940	20700		7.45	19	60	
	Avg	55200	7940	20700			17.8	49.5	10.7
	Min	55200	7940	20700		7.45	17	39	
Apr	Max					7.31	23	60	
	Avg						17.6	58.4	20.1
	Min					7.00	15	57	
May	Max						16	57	
	Avg						16	57	1.3
	Min						16	57	
Jun	Max	25000	9100	18200		7.26	19	57	
	Avg	25000	9100	18200			17.2	56.3	17.7
	Min	25000	9100	18200		7.00	14	56	
Jul	Max								
	Avg								
	Min								
Aug	Max					7.47	29.0	53	
	Avg						20.3	53	6.2
	Min					7.03	12.0	53	
Sep	Max					8.49	21	52	
	Avg						20	50.8	16
	Min					6.91	19	48	
Oct	Max					8.56	22	54	
	Avg						20.4	50.8	1.3
	Min					6.99	19	49	
Nov	Max					7.44	19	49	
	Avg						19	49	6.6
	Min					7.44	19	49	
Dec	Max					8.15	20.5	51	
	Avg						17.6	49.3	26.9
	Min					6.85	15.5	48	
Total	Max	55200	9100	20700			29.0	60	
	Avg	40100	8520	19450			18.3	53.1	115
	Min	25000	7940	18200			12.0	39	

Annual Sewage Sludge Report Form

DIVISION OF SURFACE WATER
P.O. Box 1049
Columbus, Ohio 43216-1049

Table 2: Sewage Sludge Constituents

Please Type

Facility Name:	Date:
Indian Lake Water Pollution Control	01/14/04
Ohio EPA Permit #:	**NPDES Application #: OH**
1PK00002*GD	0036641

Values Reported for Calendar Year 2003

		01003 As (mg/kg)	01013 Be (mg/kg)	01028 Cd (mg/kg)	01029 Cr (mg/kg)	01043 Cu (mg/kg)	01052 Pb (mg/kg)	01068 Ni (mg/kg)	01093 Zn (mg/kg)	01148 Se (mg/kg)	71921 Hg (mg/kg)	78465 Mo (mg/kg)
Jan	Max											
	Avg											
	Min											
Feb	Max											
	Avg											
	Min											
Mar	Max											
	Avg											
	Min											
Apr	Max											
	Avg											
	Min											
May	Max											
	Avg											
	Min											
Jun	Max	10		3.1	31	650	47	28	1200	AA	.67	37
	Avg	10		3.1	31	650	47	28	1200	AA	.67	37
	Min	10		3.1	31	650	47	28	1200	AA	.67	37
Jul	Max											
	Avg											
	Min											
Aug	Max											
	Avg											
	Min											
Sep	Max											
	Avg											
	Min											
Oct	Max	AA		AA	6.5	130	11	6.7	270	AA	.23	6.8
	Avg	AA		AA	6.5	130	11	6.7	270	AA	.23	6.8
	Min	AA		AA	6.5	130	11	6.7	270	AA	.23	6.8
Nov	Max											
	Avg											
	Min											
Dec	Max	AA		AA	6.9	140	14	6.2	280	AA	AA	8.4
	Avg	AA		AA	6.9	140	14	6.2	280	AA	AA	8.4
	Min	AA		AA	6.9	140	14	6.2	280	AA	AA	8.4
Total	Max	10		3.1	31	650	47	28	1200		.67	37
	Avg	10		3.1	14.8	307	24	13.6	583	AA	.45	17.4
	Min	AA		AA	6.5	130	11	6.2	270		AA	6.8

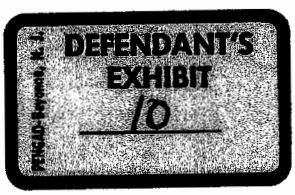
ILWPCD Section 503 Volatile Reduction/Vector Attraction Compliance

The ILWPCD met the Section 503 vector attraction requirements by reducing volatiles by 38% and by incorporating the bio-solids into the soil by plowing/disking. See 503.33(b)(10). In addition, plant operator Ron Jacob will testify that the ILWPCD volatile reduction test results understated the amount of volatile reduction that occurred during the relevant time period.

The ILWPCD's volatile reduction test results understated the amount of volatile reduction because the ILWPCD's POTW is designed to return supernatant overflow back to the raw bio-solids intake where the supernatant commingles with the raw bio-solids intake. This supernatant overflow had already been through the primary clarifiers and anaerobic digester. Thus, the commingling of the supernatant with the raw bio-solids interfered with the volatile reduction analysis.

Section 503 requires 38% volatile reduction in order to meet vector attraction requirements. The ILWPCD's volatile reduction data is attached hereto. The ILWPCD's test results, which include this volatile reduction interference, indicate that for the period at issue in this case, the ILWPCD achieved volatile reduction as follows:

April 2002 = No Land Application (No Violation)
May 2002 = 29.58%
June 2002 = 38.57% (No Violation)
July 2002 = No Land Application (No Violation)
August 2002 = 54.46% (No Violation)
September 2002 = 55.73% (No Violation)
October 2002 = 54.24% (No Violation)
November 2002 = 56.90% (No Violation)
December 2002 = 22.51%
January 2003 = 47.84% (No Violation)
February 2003 = 36.67%
March 2003 = 48.90% (No Violation)
April 2003 = 29.59%
May 2003 = 23.68%
June 2003 = 18.82%



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Apr 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Mon	2800						
02 Tue	2800						
03 Wed	6000						
04 Thu	1700						
05 Fri	2500						
06 Sat	1400						
07 Sun	1600						
08 Mon	1200						
09 Tue	11200						
10 Wed	1800						
11 Thu	3100						
12 Fri	2300						
13 Sat	5800						
14 Sun	5000						
15 Mon	2600						
16 Tue	2000						
17 Wed	2900						
18 Thu	2200						
19 Fri	8200						
20 Sat	2200						
21 Sun	2100						
22 Mon	1200						
23 Tue	1200						
24 Wed	2600						
25 Thu	3600	5.00	66.00				
26 Fri	8600						
27 Sat	12100						
28 Sun	11400						
29 Mon	2700						
30 Tue	7200						
Sum	122000	5.00	66.00				
Avg	4067	5.00	66.00				
Max	12100	5.00	66.00				
Min	1200	5.00	66.00				

untitled

May 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Wed	3000						
02 Thu	2400						
03 Fri	2600						
04 Sat	2800						
05 Sun	2200						
06 Mon	1200						
07 Tue	19000						
08 Wed	8700						
09 Thu	800						
10 Fri	4000						
11 Sat	2900						
12 Sun	4100						
13 Mon	2800	6.10	64.00				
14 Tue	2700						
15 Wed	3500						
16 Thu	10900						
17 Fri	3800						
18 Sat	3000						
19 Sun	4100						
20 Mon	2900						
21 Tue	3100						
22 Wed	2500						
23 Thu	3200					4.90	61.00
24 Fri	4300						
25 Sat	6100						
26 Sun	1400						
27 Mon	1600						
28 Tue	1300						
29 Wed	1400						
30 Thu	3000				10374		
31 Fri	1600				5928	3.80	53.00
Sum	116900	6.10	64.00		16302	8.70	114.00
Avg	3771	6.10	64.00		8151	4.35	57.00
Max	19000	6.10	64.00		10374	4.90	61.00
Min	800	6.10	64.00		5928	3.80	53.00

N⁰

untitled

Jun 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Sat	1300						
02 Sun	1000						
03 Mon	1900				10225		
04 Tue	900	6.10	61.00		10374	5.60	49.00
05 Wed	1000				12597		
06 Thu	15900				4001		
07 Fri	23400						
08 Sat	25000						
09 Sun	25100						
10 Mon	23300						
11 Tue	25700						
12 Wed	4700						
13 Thu	2700						
14 Fri	12900						
15 Sat	18500						
16 Sun	16200						
17 Mon	18100						
18 Tue	16100						
19 Wed	17400						
20 Thu	12400						
21 Fri	8700						
22 Sat	5600						
23 Sun	5700						
24 Mon	3300						
25 Tue	3500						
26 Wed	3400						
27 Thu	3000						
28 Fri	3600						
29 Sat	2200						
30 Sun	3000						
Sum	305500	6.10	61.00		37197	5.60	49.00
Avg	10183	6.10	61.00		9299	5.60	49.00
Max	25700	6.10	61.00		12597	5.60	49.00
Min	900	6.10	61.00		4001	5.60	49.00

unfitled

Jul 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Mon	5700	4.40	63.00				
02 Tue	13200						
03 Wed	16300						
04 Thu	14700						
05 Fri	11900						
06 Sat	10400						
07 Sun	21200						
08 Mon	10500						
09 Tue	11100						
10 Wed	11100						
11 Thu	12700						
12 Fri	10500						
13 Sat	10900						
14 Sun	11200						
15 Mon	11700						
16 Tue	6500						
17 Wed	2300						
18 Thu	2300						
19 Fri	2000						
20 Sat	4800						
21 Sun	2000						
22 Mon	2000						
23 Tue	2200						
24 Wed	2200						
25 Thu	2900						
26 Fri	2400						
27 Sat	2100						
28 Sun	1800						
29 Mon	2600						
30 Tue	2400						
31 Wed	2100						
Sum	225700	4.40	63.00				
Avg	7281	4.40	63.00				
Max	21200	4.40	63.00				
Min	1800	4.40	63.00				

untitled

Aug 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Thu	2100						
02 Fri	2300						
03 Sat	4300						
04 Sun	6500						
05 Mon	1900						
06 Tue	2000						
07 Wed	1800						
08 Thu	13500						
09 Fri	23100	4.20	64.00		1728	3.40	51.00
10 Sat	17600						
11 Sun	19700						
12 Mon	19000				9936		
13 Tue	16600						
14 Wed	16000				9072		
15 Thu	14600				12528		
16 Fri	14500				6480		
17 Sat	15100						
18 Sun	11700						
19 Mon	16500	3.90	60.00		8640	7.10	40.00
20 Tue	14900				8064		
21 Wed	18400				10944		
22 Thu	13900				16848		
23 Fri	11100						
24 Sat	10700						
25 Sun	11500						
26 Mon	10200	4.30	64.00		11088	7.50	39.00
27 Tue	8700				10368		
28 Wed	8200				12960		
29 Thu	8800				3024		
30 Fri	7200						
31 Sat	7000						
Sum	349400	12.40	188.00		121680	18.00	130.00
Avg	11271	4.13	62.67		9360	6.00	43.33
Max	23100	4.30	64.00		16848	7.50	51.00
Min	1800	3.90	60.00		1728	3.40	39.00

unfitled

Sep 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Sun	5700						
02 Mon	7500						
03 Tue	7400				11232		
04 Wed	7000				11664		
05 Thu	6900	4.30	65.00		11520	3.60	53.00
06 Fri	1500				8640		
07 Sat	0						
08 Sun	0						
09 Mon	0				11376		
10 Tue	2700						
11 Wed	14400						
12 Thu	4800				7056		
13 Fri	6700				10080		
14 Sat	5700						
15 Sun	5000						
16 Mon	6600	4.70	62.00		10080	8.00	34.00
17 Tue	5400				10224		
18 Wed	5400				9504		
19 Thu	5200						
20 Fri	5400						
21 Sat	6300						
22 Sun	3900						
23 Mon	5200				9072		
24 Tue	4900	3.90	63.00		12240	4.20	43.00
25 Wed	9200				12096		
26 Thu	11000				11664		
27 Fri	9700				7776		
28 Sat	9700						
29 Sun	9700						
30 Mon	8300				8640		
Sum	181200	12.90	190.00		162864	15.80	130.00
Avg	6040	4.30	63.33		10179	5.27	43.33
Max	14400	4.70	65.00		12240	8.00	53.00
Min	0	3.90	62.00		7056	3.60	34.00

untitled

Oct 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Tue	13500	4.30	64.00		11178	4.30	55.00
02 Wed	10800				6762		
03 Thu	10700				6900		
04 Fri	13300						
05 Sat	11500						
06 Sun	11800						
07 Mon	13600	4.30	65.00		6348	11.00	33.00
08 Tue	12100				8832		
09 Wed	13400				11454		
10 Thu	12800				11454		
11 Fri	13300				11730		
12 Sat	10400						
13 Sun	21700						
14 Mon	7000						
15 Tue	5300				11592		
16 Wed	11500				10764	5.50	54.00
17 Thu	10900						
18 Fri	12700				8418		
19 Sat	10800						
20 Sun	8400						
21 Mon	11200				5934	5.60	55.00
22 Tue	9200				10902		
23 Wed	9600				11454		
24 Thu	11600				7314		
25 Fri	10700						
26 Sat	8000						
27 Sun	8400						
28 Mon	9200				9108	9.70	30.00
29 Tue	10000				8556		
30 Wed	9900				10074		
31 Thu	9300				10212		
Sum	342600	8.60	129.00		178986	36.10	227.00
Avg	11052	4.30	64.50		9420	7.22	45.40
Max	21700	4.30	65.00		11730	11.00	55.00
Min	5300	4.30	64.00		5934	4.30	30.00

unfitled

Nov 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Fri	9800				10626		
02 Sat	9400						
03 Sun	6900						
04 Mon	10500				9246		
05 Tue	11200	4.30	67.00		11454	4.70	47.00
06 Wed	7700				10764		
07 Thu	5100				10488		
08 Fri	4600				5658		
09 Sat	3600						
10 Sun	8400						
11 Mon	4700						
12 Tue	7400				10074		
13 Wed	8000				10074		
14 Thu	6400				11316		
15 Fri	9000				10764		
16 Sat	9200						
17 Sun	6900						
18 Mon	10300	4.40	64.00		9936	4.40	43.00
19 Tue	4800				11318		
20 Wed	5800				11592		
21 Thu	26200				11040		
22 Fri	12500						
23 Sat	9000						
24 Sun	7400						
25 Mon	9500				9936		
26 Tue	4700				11454		
27 Wed	6900				9660		
28 Thu	3900						
29 Fri	4700						
30 Sat	3700						
Sum	238200	8.70	131.00		175400	9.10	90.00
Avg	7940	4.35	65.50		10318	4.55	45.00
Max	26200	4.40	67.00		11592	4.70	47.00
Min	3600	4.30	64.00		5658	4.40	43.00

unfitled

Dec 2002	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	AnDig Ef Flow Gpd GPD Daily	AnDig Ef Solids % % Daily	AnDig Ef Solids Vol % % Daily
01 Sun	2900						
02 Mon	3500				8832		
03 Tue	3700				4554		
04 Wed	32600				9936		
05 Thu	27500						
06 Fri	12200				2760		
07 Sat	22900						
08 Sun	9800						
09 Mon	12300	4.80	65.00		9936	4.20	59.00
10 Tue	9700				4830		
11 Wed	11300				11316		
12 Thu	7900				4692		
13 Fri	8000						
14 Sat	7500						
15 Sun	7200						
16 Mon	6700						
17 Tue	3300						
18 Wed	9100						
19 Thu	9700						
20 Fri	5200						
21 Sat	4700						
22 Sun	9100						
23 Mon	7000						
24 Tue	4600						
25 Wed	5200						
26 Thu	9700						
27 Fri	10300						
28 Sat	10700						
29 Sun	7400						
30 Mon	8700						
31 Tue	4600						
Sum	295000	4.80	65.00		56856	4.20	59.00
Avg	9516	4.80	65.00		7107	4.20	59.00
Max	32600	4.80	65.00		11316	4.20	59.00
Min	2900	4.80	65.00		2760	4.20	59.00

untitled

Jan 2003	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	Prs Feed Flow Gpd GPD Daily	Prs Feed Solids % % Daily	Prs Feed Solids Vol % % Daily
01 Wed	5400						
02 Thu	3000						
03 Fri	13100						
04 Sat	28100						
05 Sun	15400						
06 Mon	9800						
07 Tue	4100	4.50	69.00				
08 Wed	2300						
09 Thu	4300						
10 Fri	5700						
11 Sat	6100						
12 Sun	9700						
13 Mon	3100						
14 Tue	11700						
15 Wed	4100						
16 Thu	1600						
17 Fri	14300						
18 Sat	6500						
19 Sun	4400						
20 Mon	3900						
21 Tue	8400						
22 Wed	4300						
23 Thu	4700						
24 Fri	10800						
25 Sat	8800						
26 Sun	14300						
27 Mon	5100						
28 Tue	4300						
29 Wed	5500	4.00	66.00			6.30	52.00
30 Thu	7400						
31 Fri	4600						
Sum	234800	8.50	135.00			6.30	52.00
Avg	7574	4.25	67.50			6.30	52.00
Max	28100	4.50	69.00			6.30	52.00
Min	1600	4.00	66.00			6.30	52.00

untitled

Feb 2003	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	Prs Feed Flow Gpd GPD Daily	Prs Feed Solids % % Daily	Prs Feed Solids Vol % % Daily
01 Sat	3300						
02 Sun	7600						
03 Mon	4700	4.30	65.00		2880	3.30	57.00
04 Tue	4700				4320		
05 Wed	4400				4032		
06 Thu	4000				3696		
07 Fri	6100						
08 Sat	6600						
09 Sun	6200				2880		
10 Mon	7100	4.40	71.00	88.00	3504	3.90	54.00
11 Tue	11800			90.00	3120		
12 Wed	10500			88.00			
13 Thu	6400			88.00			
14 Fri	6400			88.00	3312		
15 Sat	5400			87.00			
16 Sun	3900			87.00			
17 Mon	4600			89.00			
18 Tue	2900			88.00			
19 Wed	14100	4.30	66.00	88.00	2736	4.40	57.00
20 Thu	13200			88.00	3984		
21 Fri	7000	3.80	65.00	88.00	3888	2.90	57.00
22 Sat	5900			88.00			
23 Sun	3100			88.00			
24 Mon	14500	4.50	69.00	87.00	3120	3.70	58.00
25 Tue	8200			86.00	4080		
26 Wed	6900			89.00	2928		
27 Thu	6600			86.00	3888		
28 Fri	5000	4.80	70.00	87.00	3936	2.70	59.00
Sum	191100	26.10	406.00	1668.00	56304	20.90	342.00
Avg	6825	4.35	67.67	87.79	3519	3.48	57.00
Max	14500	4.80	71.00	90.00	4320	4.40	59.00
Min	2900	3.80	65.00	86.00	2736	2.70	54.00

untitled

Mar 2003	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	Prs Feed Flow Gpd GPD Daily	Prs Feed Solids % % Daily	Prs Feed Solids Vol % % Daily
01 Sat	8700			87.00			
02 Sun	4600			87.00			
03 Mon	4600	4.50	68.00	87.00	4325	3.40	57.00
04 Tue	5900			87.00	3943		
05 Wed	5100			87.00			
06 Thu	6900			87.00	2989		
07 Fri	10000			90.00	5660		
08 Sat	10600			90.00			
09 Sun	7500			90.00			
10 Mon	5200	4.60	68.00	89.00	3244	3.30	42.00
11 Tue	5800			89.00	5024		
12 Wed	4300			90.00	5342		
13 Thu	3600				2226		
14 Fri	3400						
15 Sat	10000			93.00			
16 Sun	4600			91.00			
17 Mon	4900	5.10	68.00	92.00	4261	11.00	39.00
18 Tue	5800			91.00	4961		
19 Wed	7700			91.00	5406		
20 Thu	20100			94.00	552		
21 Fri	11200			93.00	4897		
22 Sat	7800			93.00			
23 Sun	13900			93.00			
24 Mon	17200	5.00	67.00	92.00	7722	2.60	60.00
25 Tue	15400			90.00	8316		
26 Wed	7700			90.00	7524		
27 Thu	9600			90.00	8415		
28 Fri	13500			92.00	10890		
29 Sat	11500						
30 Sun	10300						
31 Mon	11600	4.30	67.00	92.00		1.70	60.00
Sum	269000	23.50	338.00	2437.00	95697	22.00	258.00
Avg	8677	4.70	67.60	90.26	5317	4.40	51.60
Max	20100	5.10	68.00	94.00	10890	11.00	60.00
Min	3400	4.30	67.00	87.00	552	1.70	39.00

untitled

Apr 2003	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	Prs Feed Flow Gpd GPD Daily	Prs Feed Solids % % Daily	Prs Feed Solids Vol % % Daily
01 Tue	13000			93.00	8514		
02 Wed	14700			93.00	7425		
03 Thu	13800			91.00		3.30	57.00
04 Fri	11200			92.00			
05 Sat	11400						
06 Sun	12200						
07 Mon	14900			91.00			
08 Tue	11100			91.00			
09 Wed	10700	4.60	68.00	91.00		3.20	58.00
10 Thu	17900			91.00	9405		
11 Fri	13700			91.00	4059		
12 Sat	13500			91.00			
13 Sun	14900			91.00			
14 Mon	8800	3.80	65.00	89.00	5445	2.60	59.00
15 Tue	15700			92.00	8316		
16 Wed	18700			91.00	7425		
17 Thu	16800			91.00	6336		
18 Fri	19100			90.00	4950		
19 Sat	17400			90.00			
20 Sun	20300			89.00			
21 Mon	4900	3.50	65.00	88.00		4.70	57.00
22 Tue	6500			89.00	7650		
23 Wed	1200			91.00	11850		
24 Thu	13100			91.00	11850		
25 Fri	12900			91.00	8400		
26 Sat	14300			91.00			
27 Sun	13600			91.00			
28 Mon	15700			91.00	9600		
29 Tue	12100			91.00	11850		
30 Wed	10000			92.00	9522		
Sum	394100	11.90	198.00	2544.00	132597	13.80	231.00
Avg	13137	3.97	66.00	90.86	8287	3.45	57.75
Max	20300	4.60	68.00	93.00	11850	4.70	59.00
Min	1200	3.50	65.00	88.00	4059	2.60	57.00

untitled

May 2003	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	Prs Feed Flow Gpd GPD Daily	Prs Feed Solids % % Daily	Prs Feed Solids Vol % % Daily
01 Thu	10100			93.00	9480	3.40	
02 Fri	17800			93.00			
03 Sat	13900			93.00			
04 Sun	13800						
05 Mon	14400	4.40	66.00	94.00		4.20	55.00
06 Tue	15900			94.00			
07 Wed	17300			94.00			
08 Thu	17300			94.00			
09 Fri	17800			94.00			
10 Sat	17600			94.00			
11 Sun	16900			94.00			
12 Mon	14800	3.80	60.00	93.00		3.20	56.00
13 Tue	12300			93.00			
14 Wed	10900			94.00			
15 Thu	23200			95.00			
16 Fri	26000			92.00			
17 Sat	29100			92.00			
18 Sun	18900			92.00			
19 Mon	13500	4.20	62.00	91.00		3.30	58.00
20 Tue	18600			92.00			
21 Wed	9900			93.00			
22 Thu	15700			93.00			
23 Fri	17900			94.00			
24 Sat	21300			93.00			
25 Sun	7000			92.00			
26 Mon	15900			92.00			
27 Tue	9400	4.40	63.00	94.00		3.60	56.00
28 Wed	13700			94.00			
29 Thu	10000			93.00			
30 Fri	20800			96.00			
31 Sat	17000			98.00			
Sum	498700	16.80	251.00	2803.00	9480	17.70	225.00
Avg	16087	4.20	62.75	93.43	9480	3.54	56.25
Max	29100	4.40	66.00	98.00	9480	4.20	58.00
Min	7000	3.80	60.00	91.00	9480	3.20	55.00

untitled

Jun 2003	P Slg Flow Gpd GPD Daily	P Slg Solids % % Daily+Formula	P Slg Solids Vol % % Daily+Formula	AnDig 01 Temp Water F Degrees F Daily	Prs Feed Flow Gpd GPD Daily	Prs Feed Solids % % Daily	Prs Feed Solids Vol % % Daily
01 Sun	19200			95.00			
02 Mon	18200			94.00			
03 Tue	16700	3.70	64.00	92.00	9480	4.50	56.00
04 Wed	16400			92.00	5208		
05 Thu	12400			92.00	6300		
06 Fri	14800			93.00			
07 Sat	11800			93.00			
08 Sun	11900			93.00			
09 Mon	11500			95.00	4958		
10 Tue	18700			96.00	9720		
11 Wed	20600			96.00	9960		
12 Thu	21600			94.00	10200		
13 Fri	13900			92.00	9000		
14 Sat	13500			92.00			
15 Sun	7900			93.00			
16 Mon	8000	4.60	63.00	98.00	9120	3.40	56.00
17 Tue	17800			96.00	11178		
18 Wed	15600			97.00	11316		
19 Thu	12400			97.00			
20 Fri	13600			98.00			
21 Sat	10700			97.00			
22 Sun	12000			97.00			
23 Mon	12600	3.60	61.00	99.00		4.00	54.00
24 Tue	14900			98.00			
25 Wed	22000			99.00			
26 Thu	15900			98.00			
27 Fri	31200			98.00			
28 Sat	16800			98.00			
29 Sun	15100			98.00			
30 Mon	13100	4.00	62.00	AH		2.90	64.00
Sum	460800	15.90	250.00	2770.00	96440	14.80	230.00
Avg	15360	3.98	62.50	95.52	8767	3.70	57.50
Max	31200	4.60	64.00	99.00	11316	4.50	64.00
Min	7900	3.60	61.00	92.00	4958	2.90	54.00

APPENDIX D

NITROGEN APPLICATION RATE WORKSHEET

Nitrogen Agronomic Rate Worksheet

Complete the following information to determine the agronomic rate for a particular sewage sludge at a specific site.

A. Crop nitrogen needs _____ lb/acre

Type of crop _____

Yield goal _____

B. Existing available nitrogen _____ lb/acre

The amount of nitrogen left from previous applications and crop residue must be determined. Consult with an agronomist or agricultural engineer (e.g. county extension agent). The available nitrogen is dependent on the type of crop last planted, the geographic area, any crop residue left on the ground, and other factors.

C. Non-sludge nitrogen applications _____ lb/acre

Calculate or estimate the total amount of available nitrogen that will be applied to the property for the growing season, including: available nitrogen from commercial fertilizers, septage application, animal waste application and other materials applied to the land

D. Additional nitrogen needs _____ lb/acre

Additional (D) = Crop (A) _____ - Existing (B) _____ - Non-sludge (C) _____

Nitrogen Agronomic Rate Worksheet

E. Available nitrogen in the sludge _____ lb/ton

Using the average values of all nutrient analyses performed on the sewage sludge, calculate the available nitrogen in the sewage sludge you will be applying.

Ammonia nitrogen: _____ mg/kg x 0.002 = _____ lb/ton

Total Kjeldahl nitrogen: _____ mg/kg x 0.002 = _____ lb/ton

Organic nitrogen = total Kjeldahl nitrogen - ammonia nitrogen

Organic nitrogen = _____ lb/ton - _____ lb/ton

Organic nitrogen = _____ lb/ton

Available nitrogen = ammonia nitrogen + (30%* of organic nitrogen)

Available nitrogen = _____ lb/ton + (0.30* x _____ lb/ton)

Available nitrogen = _____ lb/ton (copy this value into E above)
* Use 15% for compost and advanced alkaline stabilized sludge.

F. Agronomic rate _____ dry ton/acre. This value must be included on form SSA-5.

Agronomic rate (dry weight basis) = additional nitrogen needs (D) ÷ available nitrogen in sludge (E)
Agronomic rate (dry weight basis) = _____ lb/acre ÷ _____ lb/ton

Agronomic rate (dry weight basis) = _____ dry ton/acre (copy this value into F above)

Nitrogen Agronomic Rate Worksheet **SAMPLE**

Complete the following information to determine the agronomic rate for a particular sewage sludge at a specific site.

A. Crop nitrogen needs ***220*** ***lb/acre***

Type of crop *Corn*

Yield goal *180 bu/acre*

B. Existing available nitrogen ***140 / 0*** ***lb/acre***

The amount of nitrogen left from previous applications and crop residue must be determined. Consult with an agronomist or agricultural engineer (e.g. county extension agent). The available nitrogen is dependent on the type of crop last planted, the geographic area, any crop residue left on the ground, and other factors.

C. Non-sludge nitrogen applications ***0 / 0*** ***lb/acre***

Calculate or estimate the total amount of available nitrogen that will be applied to the property for the growing season, including: available nitrogen from commercial fertilizers, septage application, animal waste application and other materials applied to the land

D. Additional nitrogen needs ***80 / 220*** ***lb/acre***

Additional (D) = Crop (A) *220* *- Existing (B)* *140* *- Non-sludge (C)* *0*

Additional (D) = Crop (A) *220* *- Existing (B)* *0* *- Non-sludge (C)* *0*

Nitrogen Agronomic Rate Worksheet **SAMPLE**

E. Available nitrogen in the sludge 41.9 lb/ton

Using the average values of all nutrient analyses performed on the sewage sludge, calculate the available nitrogen in the sewage sludge you will be applying.

Ammonia nitrogen: 11,601 mg/kg x 0.002 = 23.2 lb/ton

Total Kjeldahl nitrogen: 42,720 mg/kg x 0.002 = 85.4 lb/ton

Organic nitrogen = total Kjeldahl nitrogen - ammonia nitrogen

Organic nitrogen = 85.4 lb/ton - 23.2 lb/ton

Organic nitrogen = 62.2 lb/ton

Available nitrogen = ammonia nitrogen + (30% of organic nitrogen)*

Available nitrogen = 23.2 lb/ton + (0.30 x 62.2 lb/ton)*

Available nitrogen = 41.9 lb/ton (copy this value into E above)
** Use 15% for compost and advanced alkaline stabilized sludge.*

F. Agronomic rate 1.9 / 5.3 dry ton/acre. This value must be included on form SSA-5.

Agronomic rate (dry weight basis) = additional nitrogen needs (D) ÷ available nitrogen in sludge (E)
Agronomic rate (dry weight basis) = 80 / 220 lb/acre ÷ 41.9 lb/ton

Agronomic rate (dry weight basis) = 1.9 / 5.3 dry ton/acre (copy this value into F above)

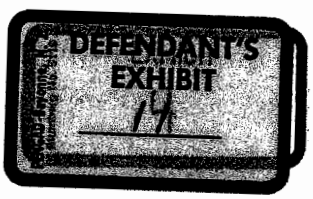
Belmont Labs

Date: *27-Dec-04*

CLIENT: Indian Lake WWTP
Project: Effluent/Soil
Lab Order: 0412675

Lab ID: 0412675-004
Client Sample ID: Soil Field 2
Collection Date: 12/15/2004 9:00:00 AM
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY, TOTAL		**SW7471**				Analyst: **RJE**
Mercury	0.14	0.10		mg/Kg-dry	1	12/22/2004 10:53:00 AM
ICP METALS, TOTAL		**SW6010B**				Analyst: **RJE**
Arsenic	8.7	3.8		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Cadmium	BDL	0.77		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Chromium	17	0.77		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Copper	71	0.77		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Molybdenum	5.5	1.5		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Nickel	32	0.77		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Lead	21	3.8		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Selenium	BDL	3.8		mg/Kg-dry	1	12/22/2004 2:12:44 PM
Zinc	180	1.5		mg/Kg-dry	1	12/22/2004 2:12:44 PM
PHOSPHORUS, TOTAL		**E365.1**				Analyst: **LG**
Phosphorus, Total .0052 x	9520 = 19.04	87.3		mg/Kg-dry	661.4	12/21/2004
PERCENT MOISTURE		**D2216**				Analyst: **KC**
Percent Moisture	24.2			wt%	1	12/20/2004
NITROGEN, ORGANIC		**M4500-N C**				Analyst: **LG**
Nitrogen, Organic	1520	1320		mg/L-dry	1	12/21/2004
SOLIDS, TOTAL		**E160.3**				Analyst: **KC**
% Solids	75.8	0.0100		%	1	12/20/2004



Indian Lake water pollution report perfect

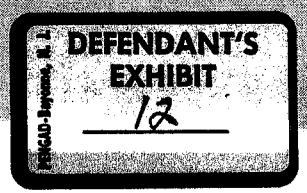
The Indian Lake Water Pollution Control lab staff has received recognition following the 2001 Discharge Monitoring Report Quality Assurance Study.

They earned special recognition for a successful evaluation and perfect report.

The study is an annual requirement of the Ohio and Federal Environmental Protection Agencies whereby each wastewater treatment facility that has a NPDES permit, an on-site lab facility and/or utilizes the services of an off-site lab facility. Analysis of listed parameters must be submitted for comparison to certified lab analysis.

Indian Lake has participated in the effort for a number of years, but has not had a perfect report before this one.

"This is a testimonial to the new lab facility and to the training and dedication of all of the district employees who have responsibilities in this area," said Garis E. Pugh, general manager of the Indian Lake district.



IN SPECIAL RECOGNITION

of achievements reached in

2001 DMRQA STUDY 21

Analytical Products Group, Inc. congratulates

Indian Lake WPCD OH0036641

for your participation and successful evaluation for the following study analytes

Carbonaceous BOD
Ammonia Nitrogen as N
Nitrate Nitrogen as N
Total Kjeldahl Nitrogen
Total Suspended Solids
pH
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Zinc
Total Residual Chlorine
Oil & Grease

Thomas J. Coyner

Thomas J. Coyner, Proficiency Program Manager

EXHIBIT 3

Blumberg No. 5119

The

Water Management Association of Ohio

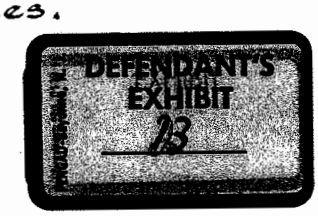
WMAO

Technician of the Year

Presented to

Ronald J. Jacob

Ron Jacob is presently employed by Floyd Brown Associates Environmental, Inc., and serves as on-site Superintendent of the Bellefontaine Waste Water Treatment Plant. Prior to Ron's taking over this responsibility, Bellefontaine's Plant was listed as being one of sixty-two (62) worst nationwide by the U.S. Environmental Protection Agency. Since 1990, in part due to Ron's efforts, the Municipal Industrial Pretreatment Program has not only turned around but has improved to the point that the Southwest District Office of OEPA has nominated Bellefontaine for the USEPA National Pretreatment Award for 1992. Ron was committed to do whatever was necessary to make the program work more effectively and in making miscellaneous improvements including the planning for bio-solids handling facilities.



November 9, 1994

James M. French
AWARDS COMMITTEE CHAIR

Robert L. Goettemoeller
PRESIDENT

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April 10, 2003

Logan County
1211-58

Mr. Garis Pugh
General Manager
Logan County Water Pollution Control
Indian Lake District
1015 Orchard Island Road
RusselsPoint, Ohio 43348

Dear Mr. Pugh:

Subject: Logan County Water Pollution Control Biosolids Management Plan

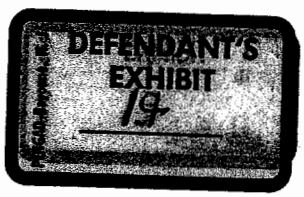
Floyd Browne Associates, Inc. (FBA) is pleased to submit the Biosolids Management Plan for the Logan County Water Pollution Control (LCWPC). When approved by Ohio Environmental Protection Agency (OEPA), the plan will supersede the existing plan.

We appreciate the opportunity to serve Logan County and look forward to assisting you in the future. As always, our interest in your operation remains. We are available to assist in any form of the implementation of this plan as may be desired.

Sincerely,

Ronald J. Jacob
Operations Specialist
Floyd Browne Associates, Inc.

Keith A. Radick
Vice President



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INTRODUCTION

Municipal wastewater is comprised, at its most basic level, of water and solids. Wastewater treatment strives to separate the two so that clean water can safely be discharged to a receiving body of water. This separation creates a residual solid material comprised of and grown from constituents that are removed from the wastewater. The proper treatment and disposal of these residuals will help to prevent disease, contamination of soil or contamination of surface or ground waters. Once the separated solids are treated to reduce the above effects, they are termed "biosolids".

The goal of biosolids management is to stabilize and reduce the volume of these residues in order to dispose of them in an economical, safe and, if possible, beneficial manner.

The purpose of a Biosolids Management Plan is to detail, in writing, the policies and procedures that will govern the execution of the Biosolids Management Program.

Guidelines in this Biosolids Management Plan are based on the most recent research information available. This plan provides for good management practices used in biosolids treatment, storage, transportation, disposal or land application.

GENERAL INFORMATION

BIOSOLIDS GENERATOR

The Logan County Water Pollution Control (LCWPC), Indian Lake District, will be the sole source of biosolids covered under this Biosolids Management Plan. The LCWPC is located at:

Logan County Water Pollution Control
1015 Orchard Island Road
Russells Point, Ohio 43348 Telephone: (937) 843-3328

ORIGIN AND TREATMENT

The biosolids generated at the LCWPC facility originate from primary and secondary domestic wastewater sludges. These sludges are digested and stabilized by using two stage anaerobic digestion. After first stage mesophilic digestion and second stage stabilization, the biosolids are stored in any of four (4) holding tanks. Second stage stabilization and biosolids storage has a combined volume of 343,823 gallons. With an average wasting rate of 2813 gallons per day of combined primary and secondary sludges, the detention time is approximately 122 days. Stabilized biosolids, at approximately 4.1% solids concentration, are dewatered on a one meter belt filter press to approximately 17.5% cake solids. When weather conditions are not favorable for land application, five (5) sand drying beds can be utilized for storage of the cake biosolids. The 5 sand drying beds provide approximately 170 days of storage for cake biosolids.

QUANTITY OF BIOSOLIDS PRODUCED

Approximately 210 dry tons (190 metric tons) of biosolids are produced annually. This is based on the previous two (2) years' annual biosolids reports.

METHODS OF DISPOSAL

The primary method of disposal the Logan County WPC will use is land application. The County will utilize application sites primarily within Logan County on Ohio Environmental Protection Agency (OEPA) approved lands only. Sites outside Logan County will be considered if it is to the economic benefit of the County to do so. All land receiving biosolids will be

previously approved by the appropriate OEPA district office prior to application. The dry cake will be transported to the various approved land application sites via a tractor-towed seven (7) cubic yard spreader. If the County can arrange to have the landowner or farmer transport the biosolids cake, it will.

The County, as an option, may utilize landfill disposal. This option may be utilized in the cases where weather conditions prevent access to lands, when there may be breach of contract(s) and/or pathogen reduction or vector attraction reduction is not achieved. The most likely landfill to be used is the Laidlaw Waste System Inc.'s Cherokee Run Landfill. The landfill is located approximately 3 miles north of Bellefontaine in Logan County at the following address:

Allied Waste
Cherokee Run Landfill
2946 US Rt. 68 North
Bellefontaine, Ohio 43311 Telephone: (937) 593-3566
Fax: (937) 592-0037

The responsibility for proper execution of the disposal methods lies with the Logan County WPC. Specific sampling is required to determine if the biosolids meet landfill acceptance limits. Table No. 1 outlines the parameters to be sampled.

TABLE NO. 1

LANDFILL MONITORING REQUIREMENTS

PARAMETERS
pH
Reactive cyanide
Reactive Sulfide
Paint Filter
TCLP Metals
TCLP Volatiles
TCLP Semi-Volatiles

In addition to the above analytical, a "Generator Waste Profile Sheet" must be completed

and submitted (see Appendix A).

NOTE: Since landfilling is an alternate action and the fact that regulations do change, it is advised to contact the landfill of choice and obtain their most current requirements.

OEPA Requirements for Landfill Disposal

Presently, the OEPA requires all entities that use landfill disposal to sample and submit total solids on a dry weight basis. When and if the County chooses to utilize landfill disposal, contact the local OEPA District Office. Modifications may have to be made to the Logan County WPC National Pollutant Discharge Elimination (NPDES) permit in regards to monitoring and reporting requirements.

BIOSOLIDS MANAGEMENT

LAND APPLICATION OF BIOSOLIDS

As stated under "Methods of Disposal" in this Biosolids Management Plan (BMP), the County will utilize land application as the primary means of disposal. This section of the BMP will address land application procedures.

Areas of Application

Biosolids generated under this program will be land applied principally to OEPA approved sites in Logan County. However, as stated above, application outside the county will be considered if it is to the benefit of the County. For example, if a private contractor is used, or if substantial labor savings may be achieved, sites may extend outside the Logan County area; however, such sites must meet all approval criteria set by OEPA.

Contracts and Agreements

A written agreement will be obtained for each land application site detailing the obligations of all parties concerned. A sample agreement is included in Appendix B. The County will provide the biosolids and manpower and conduct all analyses of soil, surface water, and groundwater in accordance with the OEPA Land Application of Sludge Manual if required. The landowner, in return, will provide the application site and access thereto.

INITIAL BIOSOLIDS ANALYSIS

Metals and Loading Rates

Listed in Table No. 2 are the analyses performed during the months of June and December 2002 for all required metals in accordance with the County's NPDES permit # 1PK00002*GD.

TABLE NO. 2

METAL ANALYSIS: mg/kg

Month/Year	As	Cd	Cr	Cu	Pb	Ni	Zn	Se	Hg	Mo
June/2002	12	3	24	480	44	27	1100	AA	0.93	38
Dec/2002	AA	AA	31	810	55	28	1500	AA	0.78	56

* "AA" = Below Detectable Limits.

Listed in Table No. 3 are Tables No. I, II, and III from the Code of Federal Regulations (CFR) Part 503.13 and the Ohio Sewage Sludge Rules. Transposed into Table No. 3, in parentheses, are the concentrations from Table No. 2 indicating that all metals are below ceiling concentrations. If any metal is above the monthly average concentration but below the ceiling concentration, the County is subject to Cumulative Pollutant Loading Rates (CPLR). These rates, when applicable, will be calculated by using the CPLR sheet included in Appendix C. The County is well below the monthly average and ceiling concentrations, and is therefore not subject to CPLR. The County is, however, subject to crop nutrient loads.

TABLE NO. 3

METALS LIMITATIONS (Dry Weight Basis)

PARAMETER	I CEILING CONCENTRATION mg/kg LIMIT (County)	II CUMULATIVE LOADING RATES lb/ac	III MONTHLY AVERAGE CONCENTRATION mg/kg LIMIT
Arsenic	75 (12)	36.6	41
Cadmium	85 (3)	34.8	39
Copper	4300 (810)	1339.9	1500
Lead	840 (55)	267.9	300
Mercury	57 (0.93)	15.2	17
Molybdenum	75 (56)	NO LIMIT	NO LIMIT
Nickel	420 (28)	375.1	420
Selenium	100 (AA)	89.3	100
Zinc	7500 (1500)	2500.4	2800

"AA" = Below Detectable Limits

Pathogen Density

The LCWPC facility will meet the pathogen density requirements listed in 40 CFR 503 for Class B sludge as stated under Alternative 2: process 3 and listed in the Ohio Sewage Sludge Rules 3745-40-05 paragraph O, Alternative 2, paragraph c (process number 3). The requirements are as follows:

Alternative 2: *Processes to significantly reduce pathogens. Sewage sludge that is used or disposed shall be treated in one of the following processes to significantly reduce pathogens.*

Process 3: *Anaerobic digestion. Sewage sludge is treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and the temperature shall be between fifteen (15) days at thirty-five (35) and fifty-five (55) degrees Celsius and sixty (60) days at twenty (20) degrees Celsius.*

The first stage digester is the only heated unit at the LCWPC. It is therefore the only unit that may be used in a calculation to meet the 15 day requirement. The volume of the secondary digester may be used, but a 60 day mean cell residence time (MCRT) must be met if it is. The following equation may be used to calculate the nominal average MCRT in the first stage anaerobic digester at the LCWPC facility:

$$\text{Nominal Average MCRT} = \frac{V \times C_V}{Q \times C_Q}$$

where: V = volume of liquid in the anaerobic digester

C_V = % solids in the digester

Q = sludge flow leaving the digester

C_Q = % solids in the sludge flow leaving the digester

Note: the assumption can be made that the sludge flow leaving the digester will be equal to the sludge flow entering the digester, which is normally the case.

Vector Attraction

The LCWPC facility will meet the vector attraction reduction requirement from 40 CFR 503 for Class B sludge Option 1 and from the Ohio Sewage Sludge Rules 3745-40-05 paragraph O, Option 1 which is as follows:

Vector Attraction Reduction Option 1: *The mass of volatile solids in the sewage sludge shall be reduced by a minimum of thirty-eight (38) percent.*

The volatile solids reduction in the sewage sludge treated at the LCWPC facility may be calculated as follows:

$$\% \text{ Volatile Solids Reduction} = 1 - \frac{(FS_{fc} \times DS_{vc})}{(FS_{vc} \times DS_{fc})} \times 100$$

where:
- FS_{fc} = Feed Sludge % fixed solids
- DS_{vc} = Digested Sludge % volatile solids
- FS_{vc} = Feed Sludge % volatile solids
- DS_{fc} = Digested Sludge % fixed solids

The Feed Sludge sample shall be sludge pumped from the primary clarifier to the first stage mesophilic anaerobic digester. The Digested Sludge sample shall be the influent sludge to the belt filter press.

Nitrogen Application

The land application of biosolids will not exceed the crops' nitrogen requirements. Consideration will be given to the time of application, time of planting, soil types, crop grown, and available nitrogen left from previous applications.

Table No. 4 shows the most recent analyses of the facility's biosolids, performed for agronomic consideration. The results illustrate available nutrients.

TABLE NO. 4

NUTRIENT ANALYSES

2002	pH s.u.	Phosphorus mg/kg	NH3 mg/kg	TKN mg/kg	% Total Solids	% Volatile Solids
JUNE	7.9	19,500	10,600	42,300	17.0	49
AUGUST	7.6	15,900	7,040	33,600	17.25	43.7
DECEMBER	6.7	18,500	8,220	37,200	18.0	59.0

In order to obtain information to determine nitrogen application requirements, the Nitrogen Application Loading Rate Worksheet located in Appendix D will be used.

LAND APPLICATION SITE INFORMATION

Site Utilization

Land application sites which are suitable for agricultural use will be sought. An estimated 50 acres will be required annually for land application at the maximum theoretical biosolids production rate. This is based on an assumed application rate of 5 dry tons per acre per year.

Preliminary Screening of Sites/Sources of Information

Various publications and sources of information are available for use in screening out areas unsuitable for land application and for locating owners of the land in suitable areas. Those recommended for use include:

1. USGS maps,
2. Logan County soil survey maps,
3. Tax maps, and
4. Aerial photographs.

Evaluation of Sites

Potential sites should be evaluated taking into consideration factors such as:

1. Geographical location (proximity to surface and groundwater, distance from the

treatment plant and proximity to transportation;

2. Compatibility with land use plans (zoning, developed areas);
3. Topography (slope of land, marshes);
4. Adequate isolation distances from residences, roadways, property lines, wells, and surface waters;
5. Susceptibility of flooding;
6. Access, road weight restrictions;
7. Geology (bedrock, water table);
8. Soil types; and
9. Crops and grazing use (present and proposed).

Site Limitations and Restrictions

1. Slope: Agricultural land with slopes greater than 12% will not be used for land application.

2. Runoff Management: County soil survey maps will be consulted for information on degree of flooding. All sites will be selected to minimize runoff. Runoff will be controlled by applying biosolids to relatively flat surfaces (2 to 6% slope). If slopes from 6 to 12% are used, 80% of the soil will be covered with vegetation. If potential runoff still exists, applications will be restricted when runoff is most likely to occur (e.g. late winter or early spring).

3. Soil Characteristics: The physical properties of the soil will be evaluated during the site selection process. Sites will be chosen where soils are well enough drained during critical seasons to ease all important operational procedures. Soils with either very high or very low permeability shall be avoided. High permeability soils are soils which consist of sands and low permeability soils are soils which consist mostly of clay.

4. Bedrock: Biosolids will not be applied in areas where the depth to bedrock is less than 3 ft.

5. Stockpile: Biosolids will not be stockpiled at the application site for more than 30 days. Stockpiles will not be located in areas such as low-lying wet areas, swales, or drainage

ways. Runoff will be diverted around the stockpile area. Stockpiles will be situated where runoff will not enter adjacent properties. Stockpiles will be located at least 500 feet from neighbor occupied buildings; 500 feet from wells and ponds used for drinking water or watering livestock; 100 feet from surface waters of the state.

6. Isolation Distances: Isolation distances for land application of biosolids are designed to limit public access and minimize the chance for nuisance and pollution conditions to develop. Application isolation distances are listed in Table No. 5.

TABLE NO. 5

ISOLATION DISTANCES

LOCATION	DISTANCE IN FEET
Neighbor Occupied Buildings	100
Wells (Public & Private)*	300
Waters of the State	33
Springs	300

* Sludge application within a wellhead protection area should be consistent with the wellhead protection program for that area.

7. Depth of Ground Water Biosolids will not be applied when an aquifer system is within ten feet of the surface, when the surface soil percolation rate is greater than 2"/hr, or five feet when the surface percolation rate is less than 2"/hr.

8. Available Water Capacity (AWC) Biosolids will not be applied when the soil moisture content is high enough to potentially generate immediate runoff or leaching of sludge. Refer to Appendix E for "Available Water Capacity Chart".

Site Approval Procedure

If a specific farm meets the general criteria listed above for land application of biosolids and the landowner agrees with the application of biosolids, the County will:

1. Complete an Ohio EPA sludge site authorization packet for non EQS (non exceptional quality sludge). A copy of this packet is attached as Appendix F.

2. Prepare a Site Inspection Request Form as shown in Appendix G and forward to:

Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, OH 45402-2911

3. Conduct soil tests of tracts proposed for biosolids application.

4. Execute a written agreement with the landowner as shown in Appendix B.

The LCWPC shall abide by all regulations and permit conditions set forth by the county for which the application of biosolids will be permitted.

LANDFILL DISPOSAL OF BIOSOLIDS

PRELIMINARY ANALYSES FOR LANDFILL

Specific sampling may be required by the landfill operators to determine if the biosolids meet landfill acceptance limits. Appendix H outlines the parameters required to be monitored by Allied Waste System Inc.'s Cherokee Landfill. Due to its proximity to the Indian Lake facility, it is the most likely landfill to be used.

METHOD OF OPERATION

TRANSPORTATION

The biosolids management program will utilize County owned equipment and personnel for land application or landfill disposal. Land application of biosolids will be conducted on a year-round basis, and will be dependent on the availability of cake biosolids, weather, and field conditions.

SPILL CONTINGENCY PLAN

The OEPA will be notified immediately upon the occurrence of any significant spill via their emergency response telephone number **(1-800-282-9378)**. Instructions and recommendations will be obtained from OEPA at that time.

Equipment and personnel of the County will be used to clean up any spilled material. Spilled biosolids will be removed, within the limits of practicality, from the spill site for land application at an approved location.

APPLICATION ACCOUNTING SYSTEM

On each day that biosolids are applied, the County will keep a record of the volume of biosolids in dry tons, location, and acres covered. This will be accomplished by recording the number of trips made, and then multiplying the number of trips for each vehicle by its biosolids hauling capacity in pounds for each load. Appendix I contains a Daily Biosolids Application Sheet.

OPERATIONS

Application of biosolids will be made during daylight hours only. Application of the dry cake biosolids will be by means of surface spreading from a vehicle designed for land application of cake biosolids. Biosolids will not be applied when field conditions are not suitable due to excessive moisture. Biosolids will not be applied at any time on frozen ground with slope in excess of 2%.

APPLICATION

Surface application rates will be determined on a nutrient and heavy metal basis. Once the nutrient contents in the biosolids are determined and crops selected, nutrient balances and corresponding application rates are computed. Annual application rates will be governed by the crop nutrient requirement, while the total cumulative amount to be applied will/may be governed by heavy metals.

AGRICULTURAL MANAGEMENT PLAN

The crops to be grown on land receiving biosolids from the LCWPC will be crops commonly grown in the surrounding area, such as corn, wheat, and soybeans. The rotation of these crops will depend upon the farmers' and landowners' crop rotation patterns and individual desires. These crops are sold for use primarily as animal feed or for processing by various agricultural concerns.

Lactating dairy animals will not be grazed on pastures which have received biosolids during the year biosolids are applied. Non-dairy pasture areas shall have a 30-day waiting period before grazing will be allowed. Vegetable or root crops will be limited to the activities listed in Table No.6.

TABLE NO. 6

SITE ACTIVITY RESTRICTIONS

RESTRICTED ACTIVITY	SITE RESTRICTION
Harvest of food crop touching the ground.	14 months after application
Harvest of root crop (see next condition).	20 months after application
Harvest of root crop if biosolids is on land <4 months prior to incorporation.	38 months after application
Harvest of other food, feed, and fiber crops.	30 days after application
Harvest of turf for high contact site (e.g. golf course or lawn), or public access to turf.	1 year after application
Access to sites with high potential for public exposure.	Restrict for 1 year
Access to sites with low potential for public exposure.	Restrict for 30 days

The landowner will be encouraged to discuss crop selection and rotation with the respective County Agricultural Extension Agent to determine the proper crop management based

upon biosolids application.

PUBLIC NOTIFICATION

The permittee shall post signs at sites where Class B bulk sewage sludge is land applied. The signs shall read **"NOTICE: CLASS B SEWAGE SLUDGE HAS BEEN APPLIED TO THIS SITE."** Such signs shall include the name of the permittee and the permittee telephone number. Such signs shall be posted within twenty-five feet of an obvious access point(s) and shall be unobstructed from view. Any authorized site with road frontage shall have at least one sign facing the road, within twenty-five feet of the road when possible, and shall be unobstructed from view. **THE TEXT SHALL BE IN BLACK CAPITAL LETTERS ON A WHITE BACKGROUND AND THE LETTERS SHALL BE ONE INCH IN HEIGHT.** At sites with a low potential for public exposure, such signs shall be in place from the time land application begins to a minimum of thirty days after the termination of land application activity at the site. At sites with a high potential for public exposure, such signs shall be in place from the time land application begins to a minimum of one year after the termination of land application activity at the site.

NUISANCE ODORS

If the land application of sewage sludge results in a nuisance odor, as determined by the division (OEPA Division of Surface Water), the permittee shall be required by the division to minimize the creation of such nuisance odors.

1) Until the creation of such nuisance odors has been minimized, as determined by the division, there shall be no further delivery of sewage sludge to the land application site.

2) The Director may de-authorize a land application site for repeated nuisance odors determined by the division, violations of Chapter 3745-40 of the Ohio Administrative Code (OAC), or violations of other applicable laws or rules. Any de-authorization shall be in accordance with Chapter 3745-47 of the OAC.

LAND APPLICATION MONITORING

BIOSOLIDS MONITORING

In accordance with the County's present National Pollutant Discharge Elimination System (NPDES) permit, biosolids monitoring is required weekly, quarterly and semi-annually when sludge is removed from the wastewater treatment facility and disposed of by land application at agronomic rates.

Weekly Monitoring

Weekly monitoring for the parameters pH, Percent Total Solids, Percent Volatile Solids and Sludge Weight Dry Tons is required when biosolids are removed from the facility and land applied. These requirements notwithstanding, good management practices for land application at agronomic rates would dictate grab samples be collected and analyzed daily in lieu of weekly for the parameter Percent Total Solids.

Quarterly Nutrient Monitoring

Composite sampling is required for Ammonia Nitrogen, pH, Total Kjeldahl Nitrogen (TKN) and Phosphorus at least four times per year when biosolids are removed from the facility and land applied. The NPDES permit states that these samples should be taken in the months of March, June, September and December. If no biosolids are land applied during these months, samples should be taken the next month that biosolids are land applied. In order for the County to effectively calculate nitrogen application rates, Nitrate Nitrogen (NO3) must also be sampled and analyzed even though monitoring for this parameter is not required in the NPDES permit.

Semi-Annual Metals Monitoring

Semi-annual composite sampling is required for heavy metals. These include: Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Zinc, Selenium, Mercury and Molybdenum. The NPDES permit states that these samples should be taken in the months of June and December.

Annual Dioxin, Dibenzofuran and Coplanar PCB Monitoring

On an annual basis, the County must monitor for dioxin in biosolids (sewage sludge) as defined in the Ohio Sewage Sludge Rules (OAC Chapter 3745-40-01). All analyses for dioxin in sewage sludge shall be performed by a laboratory equipped to provide accurate results. Appendix J contains a list of OEPA approved laboratories for sludge dioxin analysis and an OEPA Dioxin, Dibenzofuran and Coplanar PCB report form.

TABLE NO. 7

MONITORING PARAMETERS AND TEST METHODS

PARAMETER	TEST METHOD	PARAMETER	TEST METHOD
pH	150.1	Arsenic	200.7/6010B
% Total Solids	160.3	Cadmium	213.1/7130
% Volatile Solids	160.4	Chromium	200.7/6010B
Ammonia Nitrogen	350.2	Copper	200.7/6010B
TKN	351.3	Lead	200.7/6010B
NO_3 Nitrogen	353.3	Nickel	200.7/6010B
Phosphorus	200.7/6010B	Zinc	200.7/6010B
Potassium	200.7/6010B	Molybdenum	200.7/6010B
Dioxin	8290	Selenium	270.2/7440
**********	**********	Mercury	245.1/7471

Biosolids Sampling Procedures

It is imperative sampling and analyses of the biosolids be performed in conformity with state and federal land application laws and procedures. It is equally important sampling be as representative as possible for use in calculations for agronomic rates. The sampling procedures are described in the following paragraphs.

When biosolids **are being dewatered on the belt filter press**, a liquid influent sample to the press will be collected and analyzed daily for Percent Total Solids. The percent solids result will be used to calculate dry pounds of solids produced per day as well as annual sludge production in dry tons. Once per week, the liquid influent sample to the press, as well as a waste sludge sample fed to the anaerobic digester, will be analyzed to determine Percent

Volatile Solids. The percent volatile results derived from these two samples will be used to calculate volatile reduction by anaerobic digestion and verification of compliance with vector attraction reduction requirements.

Additionally, when biosolids **are being dewatered by the belt filter press**, a daily cake grab sample consisting of approximately 100 grams will be collected and analyzed for Percent Total Solids and pH. The Percent Total Solids result will be used for quality control and process optimization. The left over sludge from this grab sample will be placed in a container to create a composite sample designated for semi-annual monitoring. The composite sample designated for semi-annual monitoring will be analyzed within the first two weeks of June and December. Parameters to be analyzed are Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Zinc, Selenium, Mercury and Molybdenum, all total in the sludge on a dry weight basis (mg/kg). These analytical results will be used to verify regulatory compliance with heavy metal application limitations and satisfy monitoring frequencies for heavy metals.

When biosolids **are being land applied**, additional sampling is required for determination of agronomic application rates and satisfaction of the requirement for quarterly nutrient monitoring. A grab sample of cake biosolids will be taken from each load hauled to the application site. If more than one load is taken to the field, the grab samples will be mixed to form a composite sample. A portion of this sample will be analyzed daily for Percent Total Solids. The percent total solids result, the volume of biosolids applied and the total acres covered will be used to calculate dry tons/acre applied to the field. Once per quarter, (March, June, September and December when possible) the remainder of this sample will be analyzed for Ammonia Nitrogen, pH, Total Kjeldahl Nitrogen (TKN) Nitrate Nitrogen and Phosphorus. **It is important to note the holding time for performing analyses on this sample is 28 days maximum.**

SOIL MONITORING

An initial soil test will be obtained for each farm field as it is being considered for the biosolids program. Soil samples will be sent to an approved soil analysis laboratory. This initial testing will include the standard soil tests (pH, lime deficits, ***Phosphorus** (see soil phosphorus below), Potassium, Calcium, Magnesium, and Cation Exchange Capacity) plus tests for heavy metals (Copper, Cadmium, Lead, Nickel, Zinc, Mercury, and Chromium).

After initial testing, the standard soil tests will be performed annually. Metals and nutrient application rates will be controlled through biosolids analyses along with the calculations showing the amount applied to the field.

The standard soil test results should be reviewed by the Logan County Agricultural Extension Agent. The soil test results, along with the farmer's crop plans and yield objectives, can be used to determine the best rate of biosolids application. The extension agent should then calculate the fertilizer supplement needed to bring total nutrients up to the required level to meet the farmer's needs.

Soil Phosphorus

For soils with soil **phosphorus** test results greater than one hundred fifty parts per million (three hundred pounds per acre) Bray-Kurtz P1 extraction *or* one hundred seventy parts per million (three hundred forty pounds per acre) Mehlich 3 extraction, land application of bulk sewage sludge shall either:

1) Cease until such time that soil phosphorus test results are less than or equal to one hundred fifty parts per million (three hundred pounds per acre) Bray-Kurtz P1 extraction *or* one hundred seventy parts per million (three hundred forty pounds per acre) Mehlich 3 extraction: *or*

2) Continue when it has been demonstrated to the division (OEPA Division of Surface Water) using a soil phosphorus index (Appendix K) that a low relative risk of phosphorus movement to waters of the state exists at the authorized site.

The frequency of monitoring for soil pH and soil phosphorus monitoring (Bray-Kurtz P1 or Mehlich 3 extraction) shall be such that the most recent results are not more than two years old at the time of biosolids application

COMPLIANCE MONITORING, REPORTING & RECORDKEEPING

LANDFILL DISPOSAL

In accordance with Title 40 Code of Federal Regulations (40CFR) Part 503 and the OEPA Land Application of Sludge Manual, the County, when co-disposing biosolids with municipal solid waste, does not need to control, monitor or report for the following:

1. Pathogen Reduction
2. Vector Attraction
3. Pollutant concentrations

The County only needs to report the sludge weight, in dry tons, when disposing sludge at a landfill. However, the County must demonstrate the sludge is non-hazardous by monitoring for the parameters shown in Table No. 1 of this Biosolids Management Plan on an annual basis. All analyses will be kept for a minimum of five (5) years.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

The County will monitor, maintain records, and report to the OEPA in accordance with the most current permit. Such records shall be maintained for a minimum of five (5) years.

REPORTING LAND APPLIED BIOSOLIDS

MONTHLY REPORTING

The County's current NPDES permit requires monthly submittal of a compliance monitoring report (EPA-4500) which includes pages for sludge. The sampling station reported on this page for "Sludge to disposal" (removed for land application) is 1PK00002581 (commonly called sampling station 581).

When land applying biosolids, a monthly report (example in Appendix L) will be submitted to the landowner and the farm operator.

ANNUAL REPORTING

Part II, "Other Requirements" in the NPDES permit states the following:

"Not later than January 31 of each calendar year, the permittee shall submit two (2) copies of a report summarizing the sludge disposal and/or reuse activities of the facility during the previous year. One copy of the report shall be sent to the Ohio EPA, Division of Surface Water, Central Office, and one copy of the report shall be sent to the Southwest District Office. This report shall address:

1) Amount of sludge disposed of/reused in dry tons.

2) Method(s) of disposal/reuse.

3) Summary of all analyses made on the sludge.

4) Problems encountered including any complaints received. The cause or reason for the problem and corrective actions taken to solve the problem should also be included. Any incidents of interference with the method of sludge disposal shall be identified, along with the cause of interference (i.e., excessive metals concentration, contaminated sludge, etc.) and the corrective actions taken.

In addition, the following reporting requirements also apply:

1. Certification Statements (see Appendix M). Certification statements are required for pathogen reduction, vector attraction reduction, site restrictions and management practices.
2. Description of how Class B pathogen reduction criteria are achieved.
3. Description of how vector attraction reduction criteria are achieved.

4. List of land application sites where cumulative pollutant loading rates apply.
5. Location of sites.
6. Number of acres (hectares) per site.
7. Dates and times of application.
8. Total cumulative amount of each metal per site, based on present and past records (if applicable).
9. Tons of biosolids applied per site and total per year.
10. Description of how applicable management practices and site restrictions are met.
11. Results of all chemical analyses performed.
12. Names and addresses of landowners receiving biosolids.

RECORDS RETENTION

All information obtained by the use of this plan for the proper management and application of biosolids will be kept for a period of no less than 5 (five) years.

All files and information relative to processing and application of biosolids will be maintained at the Logan County Water Pollution Control (LCWPC) facility. These records will be under the direct supervision of the LCWPC superintendent. These records will include the following:

- Management practices to meet pathogen reduction such as the daily logs of time and temperature regimes in the anaerobic digester.
- Data generated to demonstrate that vector attraction reduction requirements are met such as the volatile solids reduction calculations.
- The agronomic rate calculations used to determine biosolids loading rates in dry tons per acre for each application site.

APPENDIX A

GENERATOR WASTE PROFILE SHEET

ALLIED WASTE

GENERATOR WASTE PROFILE SHEET
Instructions for the Completion of
Generator Waste Profile Sheet

Purpose

The Generator Waste Profile Sheet is to be completed to properly identify and characterize the type of waste that is being requested for acceptance. All information provided and certified by the generator of the waste identified by the Waste Profile Sheet is true, correct, and accurate.

This form is to be used when applying for acceptance approval of a new waste stream or the renewal of an existing waste stream.

Waste Profile Sheet Information

Waste Profile Number: Leave blank. A company tracking number will be issued by the Special Waste Department.

Disposal Facility: Enter the name of the proposed landfill facility for the disposal of the non-hazardous waste stream.

I. Generator Information

Generator Name and Address: Enter the required information including the name, address, and telephone number of the company generating the waste stream for disposal. If the address to where correspondence is to be sent is different from the site address, complete the mailing address, otherwise type "SAME". Also, enter the Generator's Contact Person's name, telephone and fax numbers.

State ID Number: Applies only if State Agencies issue identification or registration numbers. For instance, Illinois EPA has a ten-digit code assigned to each generator of special waste). If the state agency does not issue a number enter "NA".

SIC Code: Each industry class is assigned a four-digit code called a Standard Industrial Classification Code. The classification is assigned to the process that generates a specific product.

II. Transporter Information

Transporter: Enter general information for the waste hauler who is to transport the waste.

III. Waste Stream Information

Waste Name: Provide the common name of the major component or substance that most accurately describes the waste.

Process Description: Provide a detailed description of the process or operation that generates the waste.

Pollution Control Waste or Industrial Process Waste: Check the one category that applies to the waste stream.

> **Pollution Control Waste** means any waste generated as a direct or indirect result of the removal of contaminants from the air, water, or land, which pose a present or potential threat to human health or to the environment or with the inherent properties that make the disposal of such waste in a landfill difficult to manage by normal means. "Pollution Control Waste" includes, but is not limited to, water and wastewater treatment plant sludge, baghouse dusts, landfill wastes, scrubber sludges, chemical spill cleaning.
>
> **Industrial Process Waste** means any waste generated as a direct or indirect result of the manufacture of the product or the performance of a service, which would pose a present or potential threat to human health or to the environment or with inherent properties that make the disposal of such waste in a landfill difficult to manage by normal means. "Industrial Process Waste" includes, but is not limited to, spent pickling liquors, cutting oils, chemical catalyst, distillation bottoms, etching acids, equipment cleaning, paint sludge, incinerator ashes (including but not limited to ash resulting from the incineration of potentially infectious medical waste), core sands, metallic dust sweepings, asbestos dust, and off-specification, contaminated or recalled wholesale or retail products. Specifically excluded are uncontaminated packaging material, uncontaminated machinery components, general household waste, landscape waste, and construction and demolition debris.

Physical State: Check one of the choices listed. Give the most accurate phase of the waste.

Method of Shipment: Check one of the choices listed. Describe the planned method of transportation to the disposal site.

Estimated Annual Volume: Specify the estimated annual volume in cubic yards or tons. If other, explain (i.e. drums).

Frequency: Check one of the choices listed. Approximately how often the disposal of the waste is to occur.

Special Handling Instructions: Indicate any specific instructions.

IV. Representative Sample Certification

Collection of Representative Sample: Indicate "Yes" or "No" that a representative sample was collected to prepare the profile sheet and laboratory analytical report in accordance with USEPA guidelines or equivalent rule. Enter the date the sample was taken. Indicate by checking whether this is a Composite Sample or Grab Sample. Enter sampler's employer company name. Type or print Sampler's name and also have the sampler sign where indicated. Circle "NO SAMPLE TAKEN" when sample was not collected.

V. Physical Characteristics of Waste

Characteristic Components: Furnish the general constituents and the relative percentages that comprise the waste. These components can have generic or chemical names. The total percentage must equal 100% (i.e. Petroleum Contaminated Soil: Soil 97-100%, unleaded gasoline 0-3%).

Color: Describe the color of the waste. If the color is variable, provide the most dominant color.

Odor: If an odor from the waste is detected give the most accurate description of that odor including what kind of odor and if it is slight, mild, or strong. If no odor is detected, indicate "none".

Free Liquids: Determine if there are free liquids in the waste (Paint Filter Test). Mark "NO" if the waste passes the test (no free liquids present). Mark "YES" if the waste fails the test (detecting the presence of free liquids).

Percent Solids: Determine the amount of solids present in the waste, provide as a percentage of the waste as a whole.

PH: Indicate the pH of the waste (corrosivity).

Flash Point: Indicate the temperature at which the waste ignites.

Phenol: The IEPA limit for Phenol concentration in any non-hazardous special waste is 1,000 total ppm (Illinois Only). List the total ppm of phenol present.

Attach Analytical Report

Eight RCRA TCLP Metals, Cyanide Total/Reactive, Sulfide Total/Reactive, Flash Point, Paint Filter, pH, Phenol, PCBs, EOX, TCLP Organics (TCLP Volatiles, TCLP Semi-Volatiles), Pesticides/Herbicides are parameters required for the majority of waste streams for approval. When performing metals and organics analysis, Total or TCLP procedure may be utilized, but any constituent whose total concentration is greater than 20 times the TCLP level, then TCLP must be performed. Where parameters are not tested, include historical background and/or Material Safety Data Sheets. Analytical used to complete this form MUST be less than one (1) year old.

Pesticides and/or Herbicides: Indicate "Yes" or "No".

Sulfide or Cyanide: Indicate "Yes" or "No".

PCBs" Indicate "Yes" or "No".
PCBs are generally used in electric capacitors, transformers, and vacuum pumps. An alternate name commonly used by laboratories for PCB is "Aroclor" followed by a number defining the special PCB tested. If PCBs are tested and separated into the Aroclor compounds, the highest detection limit is the parameter to be reported.

Non-Hazardous Waste Classification Certification: Indicate "Yes" or "No".

Dioxins: Indicate "Yes" or "No".

Toxic Material: Indicate "Yes" or "No".

Medical or Infectious Waste: Indicate "Yes" or "No".

Federal Superfund Site: Indicate "Yes" or "No".

VI. Generator Certification

The Generator Certification requires the generator name, title date, and signature. If a generator employee does not sign the Waste Profile Sheet, a letter from the generator authorizing the person (Contractor/Hauler) to sign this form on their behalf, must accompany the Waste Profile Sheet.

VII. Allied Waste Decision

Do not fill in this section. The Special Waste Department will use this section to approve or reject the waste stream, assign an expiration date and outline any special conditions or handling that may apply to the waste stream.

ALLIED WASTE

GENERATOR WASTE PROFILE SHEET

Waste Profile #

Requested Disposal Facility: _____

an Allied Waste Company

I. Generator Information

Date:			
Generator Name:			
Generator Site Address:			
City:	County:	State:	Zip:
Generator State ID Number:		SIC Code Number:	
Generator Mailing Address (if different):			
City:	County:	State:	Zip:
Generator Contact Name:			
Phone Number:		Fax Number:	

II. Transporter Information

Transporter Name:			
Transporter Address:			
City:	County:	State:	Zip:
Transporter Contact Name:			
Phone Number:		Fax Number:	
State Transportation Number:			

III. Waste Stream Information

Name of Waste:	
Process Generating Waste:	
Type of Waste:	☐ INDUSTRIAL PROCESS WASTE or ☐ POLLUTION CONTROL WASTE
Physical State:	☐ SOLID ☐ SEMI-SOLID ☐ POWDER ☐ LIQUID ☐ OTHER: _____
Method of Shipment:	☐ BULK ☐ DRUM ☐ BAGGED ☐ OTHER: _____
Estimated Annual Volume:	☐ CUBIC YARDS: _____ ☐ TONS: _____ ☐ OTHER: _____
Frequency:	☐ ONE TIME ☐ DAILY ☐ WEEKLY ☐ MONTHLY ☐ OTHER: _____
Special Handling Instructions:	

IV. Representative Sample Certification

☐ NO SAMPLE TAKEN

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA 40 CFR 261.20(c) guidelines or equivalent rules?	☐ YES or ☐ NO
Sample Date:	Type of Sample: ☐ COMPOSITE SAMPLE ☐ GRAB SAMPLE
Sampler's Employer:	
Sampler's Name (printed):	Signature:

ALLIED WASTE

GENERATOR WASTE PROFILE SHEET (continued)

Waste Profile #

V. Physical Characteristics of Waste

Characteristic Components % by Weight (range)

1.

2.

3.

Color:	Odor (describe):	Free Liquids: ☐ YES or ☐ NO Content ____%	% Solids:	pH:	Flash Point: ____ °F	Phenol ____ppm

Attach Laboratory Analytical Report (and/or Material Safety Data Sheet) Including Required Parameters Provided for this Profile

Does this waste or generating process contain regulated concentrations of the following Pesticides and/or Herbicides: Chlordane, Endrin, Heptachlor (and it epoxides), Lindane, Methoxychlor, Toxaphene, 2,4-D, or 2,4,5-TP Silvex as defined in 40 CFR 261.33?	☐ YES or ☐ NO
Does this waste or generating process cause it to exceed OSHA exposure limits from high levels of Hydrogen Sulfide or Hydrogen Cyanide as defined in 40 CFR 261.23?	☐ YES or ☐ NO
Does this waste contain regulated concentrations of Polychlorinated Biphenyls (PCBs) as defined in 40 CFR Part 761?	☐ YES or ☐ NO
Does this waste contain regulated concentrations of listed hazardous wastes defined in 40 CFR 261.31, 261.32, 261.33, including RCRA F-Listed Solvents?	☐ YES or ☐ NO
Does this waste contain regulated concentrations of 2,3,7,8-Tetrachlorodibenzodioxin (2,3,7,8-TCCD), or any other dioxin as defined in 40 CFR 261.31?	☐ YES or ☐ NO
Is this a regulated Toxic Material as defined by Federal and/or State regulations?	☐ YES or ☐ NO
Is this a regulated Radioactive Waste as defined by Federal and/or State regulations?	☐ YES or ☐ NO
Is this a regulated Medical or Infectious Waste as defined by Federal and/or State regulations?	☐ YES or ☐ NO
Is this waste generated at a Federal Superfund Clean Up Site?	☐ YES or ☐ NO

VI. Generator Certification

I hereby certify that to the best of my knowledge and belief, the information contained herein is a true and accurate description of the waste material being offered for disposal. I further certify that by utilizing this profile, neither myself nor any other employee of the company will deliver for disposal or attempt to deliver for disposal any waste which is classified as toxic waste, hazardous waste or infectious waste, or any other waste material this facility is prohibited from accepting by law. Our company hereby agrees to fully indemnify this disposal facility against any damages resulting from this certification being inaccurate or untrue. I further certify that the company has not altered the form or content of this profile sheet as provided by Allied Waste Industries, Inc.

AUTHORIZED REPRESENTATIVE NAME AND TITLE (Printed) COMPANY NAME

AUTHORIZED REPRESENTATIVE SIGNATURE DATE

VII. Allied Waste Decision

☐ Approved ☐ Rejected Expiration: _____

Conditions:

Name, Title Signature Date

HOW AND WHEN TO USE THE RECERTIFICATION FORM

The *Generator Waste Profile Sheet – Recertification* may be used to renew existing Allied Waste *Generator Waste Profile Sheets*. It cannot be used to recertify waste streams previously approved under other company's forms. The generator will retain his same Waste Authorization Number.

a. The proposed disposal facility.
b. The existing waste profile authorization number.
c. The current year
d. The date the recertification is being submitted.
e. Update the Generator name and site address as it is on the original Waste Profile. This should be the same. If there are any changes, it may be a new waste stream.
f. and g. Update the Generator mailing address, contact name and phone number.

Disposal Facility: A

Waste Authorization #: B re-cert year: C

Date: D

I. Generator Information

Generator Name: E			
Generator Site Address:			
City:	County:	State:	Zip:
Generator Mailing Address (if different): F			
City:	County:	State:	Zip:
Generator Contact Name: G			
Phone Number:		Fax Number:	

a. The Name of Waste must be the same as it was on the original profile.
b. If the Generator checks Item 1, then the waste cannot be recertified. It must be submitted as a new waste stream.
c. If the Generator indicates that there have been no changes in the waste stream, they may renew their approval. Updated analyticals are required to verify that the waste stream is the same as when originally profiled.

II. Waste Stream Information

Name of Waste: A

Check Section 1 OR Section 2 below:

1. B — There has been a change in the characteristics of the waste stream due to the following:
   a. Change of a raw material used in the waste generating process.
   b. Change in the waste generating process itself.
   c. Change in a physical characteristic of the waste.
   d. New information has been documented concerning the human health effects of exposure to the waste.

   If any of these changes have occurred, a new laboratory analysis and profile sheet must be completed. Attach copies of the new chemical analysis and new Generator Waste Profile Sheet with the appropriate signatures.

2. C — There have been no changes that would alter the physical characteristics of the special waste stream. Attach a copy of the original Generator Waste Profile Sheet. Updated analyticals may be required.

Any time analyticals are submitted for review the generator must certify that they are representative of the waste being sent for disposal.

III. Representative Sample Certification

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA 40 CFR 261.20(c) guidelines or equivalent rules?	☐ YES or ☐ NO
Sample Date:	Type of Sample: ☐ COMPOSITE SAMPLE ☐ GRAB SAMPLE
Laboratory:	Sample ID Numbers:
Sampler's Employer:	
Sampler's Name (printed):	Signature:

The generator must sign and date the certification to agree that everything submitted previously and currently is complete and accurate.

IV. Generator Certification

I hereby certify that to the best of my knowledge and belief, the information contained in the Waste Recertification and the information in the Generator Waste Profile Sheet is true, complete and accurate.

Authorized Representative Name And Title (Printed) | Company Name

Authorized Representative Signature | Date

A representative of the corporate Special Waste Department will sign and date the approval and assign a new expiration date. Copies of the approved Recertification must be sent to the generator and filed in the generator special waste file at the landfill

V. Allied Waste Recertification

☐ Approved ☐ Rejected Expiration: _____

Conditions: All conditions of the original profile and approval remain in effect.

Name, Title | Signature | Date

ALLIED WASTE

GENERATOR WASTE PROFILE SHEET - RECERTIFICATION

Disposal Facility: _____	Waste Authorizaton #
	re-cert year:
	Date:

I. Generator Information

Generator Name:			
Generator Site Address:			
City:	County:	State:	Zip:
Generator Mailing Address (if different):			
City:	County:	State:	Zip:
Generator Contact Name:			
Phone Number:		Fax Number:	

II. Waste Stream Information

Name of Waste:

Check Section 1 OR Section 2 below:

1. ☐ <u>There has been a change</u> in the characteristics of the waste stream due to the following:
   a. Change of a raw material used in the waste generating process.
   b. Change in the waste generating process itself.
   c. Change in a physical characteristic of the waste.
   d. New information has been documented concerning the human health effects of exposure to the waste.

   If any of these changes have occurred, a new laboratory analysis and profile sheet must be completed. Attach copies of the new chemical analysis and new Generator Waste Profile Sheet with the appropriate signatures.

2. ☐ <u>There have been no changes</u> that would alter the physical characteristics of the special waste stream. Attach a copy of the original Generator Waste Profile Sheet. Updated analytical may be required.

III. Representative Sample Certification

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA 40 CFR 261.20(c) guidelines or equivalent rules?	☐ YES or ☐ NO
Sample Date:	Type of Sample: ☐ COMPOSITE SAMPLE ☐ GRAB SAMPLE
Laboratory:	Sample ID Numbers:
Sampler's Employer:	
Sampler's Name (printed):	Signature:

IV. Generator Certification

I hereby certify that to the best of my knowledge and belief, the information contained in the Waste Recertification and the information in the Generator Waste Profile Sheet is true, complete and accurate.

_____ _____
Authorized Representative Name And Title (Printed) Company Name

_____ _____
Authorized Representative Signature Date

V. ALLIED WASTE RECERTIFICATION

☐ Approved ☐ Rejected Expiration: _____

Conditions: All conditions of the original profile and approval remain in effect.

_____ _____ _____
Name, Title Signature Date

APPENDIX B

LAND APPLICATION AGREEMENT

Logan County Water Pollution Control (LCWPC)
LAND APPLICATION AGREEMENT

I. Parties agree that this is an agreement between the landowner, _____ whose address is _____ and the Sewage Sludge Generator, the Logan County Water Pollution Control Facility, 1015 Orchard Island Road, Russells Point, Ohio 43348. The location of the land which is to receive sludge is:

_____ ,

and it contains approximately _____ acres.

II. The boundaries of site, entrance, and exit points are more completely shown in the attached Exhibit.

III. The parties agree that the sludge quantity to be applied will be at the rate(s) required by the Ohio Environmental Protection Agency regulations for sludge application.

IV. The LCWPC, without cost to the landowner, will do the following:

(a) Provide such tests and records as needed for the proper application of sludge, but not beyond those required under regulations governing the land application of sludge.
(b) Apply sludge to the extent feasible on areas allocated by the landowner, but not on areas within regulator specified isolation distances.
(c) Apply sludge only as weather and ground conditions permit.
(d) Will develop to the extent feasible, alternative routes in and out of fields to avoid compaction in traffic areas.
(e) Will accept such limitations in the operations as required by the landowner to ensure that runoff nuisance, or health problems do not occur.

V. The landowner, without cost to the LCWPC, will do the following:

(a) Permit representatives of the LCWPC access, including vehicles and equipment necessary to conduct tests related to the application of sludge.
(b) Will provide the LCWPC with data that is or becomes available to the land on which the sludge is to be or being applied.
(c) Because of the landowner's responsibility that runoff, nuisance, or health problems do not occur, the landowner will advise the LCWPC his/her required limitations concerning the LCWPC operations.
(d) Restricted Activity -- Site Restriction:
    (1) Harvest of food crop touching ground -- 14 months after last application.
    (2) Harvest of root crop -- 20 months after last application.
    (3) Harvest of root crop if sludge is on land <4 months prior to incorporation -- 38 months after last application.
    (4) Harvest of other food, feed and fiber crops -- 30 days after last application.
    (5) Grazing of animals -- 30 days after last application.
    (6) Grazing of lactating dairy animals -- At least 1 year after last application.
    (7) Harvest of turf for high contact site (e.g. golf course or lawn), or public access to turf -- 1 year after last application.
    (8) Access to sites with high potential for public exposure -- Restrict for 1 year.
    (9) Access to sites with low potential for public exposure -- Restrict for 30 days.

VI. Either party to this agreement, that being the landowner or the LCWPC, has the option to terminate the agreement at any time upon demand. Demand upon the LCWPC is to be made to the LCWPC Superintendent. Demand upon the landowner is to be made to the landowner.

Date: _____ day of _____ , 20___

_____ LANDOWNER

_____ Logan County Water Pollution Control

APPENDIX C

CUMULATIVE POLLUTANT LOADING RATES (CPLR WORKSHEET)

CUMULATIVE POLLUTANT LOADING RATE WORKSHEET									
Site name and location:				Date of application:					
Site ID:				Date of last Application:					
Latitude:				Sludge application rate (tons/acre):					
Longitude:									
Pollutant	Cumulative Pollutant Loading Rate (lbs/acre)		Calculation for Determining Cumulative Pollutant Loading Rate						
	A	B	C	D	E	F = CxDxE	G	H = F + G	I = A - H
	100%	90%	Sludge metals conc.	Sludge application rate	Conversion factor	Pollutant loading for application	CPLR before application	CPLR to date	CPLR remaining
			mg/kg	tons/acre		lbs/acre	lbs/acre	lbs/acre	lbs/acre
Arsenic	36	32			0.002				
Cadmium	34	31			0.002				
Copper	1,340	1,206			0.002				
Lead	268	241			0.002				
Mercury	15	14			0.002				
Molybdenum	-	-			0.002				
Nickel	375	338			0.002				
Selenium	89	80			0.002				
Zinc	2,500	2,250			0.002				

APPENDIX D

NITROGEN APPLICATION RATE WORKSHEET

Nitrogen Agronomic Rate Worksheet

Complete the following information to determine the agronomic rate for a particular sewage sludge at a specific site.

A. Crop nitrogen needs _____ lb/acre

Type of crop _____

Yield goal _____

B. Existing available nitrogen _____ lb/acre

The amount of nitrogen left from previous applications and crop residue must be determined. Consult with an agronomist or agricultural engineer (e.g. county extension agent). The available nitrogen is dependent on the type of crop last planted, the geographic area, any crop residue left on the ground, and other factors.

C. Non-sludge nitrogen applications _____ lb/acre

Calculate or estimate the total amount of available nitrogen that will be applied to the property for the growing season, including: available nitrogen from commercial fertilizers, septage application, animal waste application and other materials applied to the land

D. Additional nitrogen needs _____ lb/acre

Additional (D) = Crop (A) _____ - Existing (B) _____ - Non-sludge (C) _____

Nitrogen Agronomic Rate Worksheet

E. Available nitrogen in the sludge _____ lb/ton

Using the average values of all nutrient analyses performed on the sewage sludge, calculate the available nitrogen in the sewage sludge you will be applying.

Ammonia nitrogen: _____ mg/kg x 0.002 = _____ lb/ton

Total Kjeldahl nitrogen: _____ mg/kg x 0.002 = _____ lb/ton

Organic nitrogen = total Kjeldahl nitrogen - ammonia nitrogen

Organic nitrogen = _____ lb/ton - _____ lb/ton

Organic nitrogen = _____ lb/ton

Available nitrogen = ammonia nitrogen + (30%* of organic nitrogen)

Available nitrogen = _____ lb/ton + (0.30* x _____ lb/ton)

Available nitrogen = _____ lb/ton (copy this value into E above)
* Use 15% for compost and advanced alkaline stabilized sludge.

F. Agronomic rate _____ dry ton/acre. This value must be included on form SSA-5.

Agronomic rate (dry weight basis) = additional nitrogen needs (D) ÷ available nitrogen in sludge (E)
Agronomic rate (dry weight basis) = _____ lb/acre ÷ _____ lb/ton

Agronomic rate (dry weight basis) = _____ dry ton/acre (copy this value into F above)

Nitrogen Agronomic Rate Worksheet **SAMPLE**

Complete the following information to determine the agronomic rate for a particular sewage sludge at a specific site.

A. Crop nitrogen needs *220* ***lb/acre***

Type of crop *Corn*

Yield goal *180 bu/acre*

B. Existing available nitrogen *140 / 0* ***lb/acre***

The amount of nitrogen left from previous applications and crop residue must be determined. Consult with an agronomist or agricultural engineer (e.g. county extension agent). The available nitrogen is dependent on the type of crop last planted, the geographic area, any crop residue left on the ground, and other factors.

C. Non-sludge nitrogen applications *0 / 0* ***lb/acre***

Calculate or estimate the total amount of available nitrogen that will be applied to the property for the growing season, including: available nitrogen from commercial fertilizers, septage application, animal waste application and other materials applied to the land

D. Additional nitrogen needs *80 / 220* ***lb/acre***

Additional (D) = Crop (A) *220* *- Existing (B)* *140* *- Non-sludge (C)* *0*

Additional (D) = Crop (A) *220* *- Existing (B)* *0* *- Non-sludge (C)* *0*

Nitrogen Agronomic Rate Worksheet **SAMPLE**

E. Available nitrogen in the sludge *41.9* ***lb/ton***

Using the average values of all nutrient analyses performed on the sewage sludge, calculate the available nitrogen in the sewage sludge you will be applying.

Ammonia nitrogen: *11,601* *mg/kg x 0.002 =* *23.2* *lb/ton*

Total Kjeldahl nitrogen: *42,720* *mg/kg x 0.002 =* *85.4* *lb/ton*

Organic nitrogen = total Kjeldahl nitrogen - ammonia nitrogen

Organic nitrogen = *85.4* *lb/ton -* *23.2* *lb/ton*

Organic nitrogen = *62.2* *lb/ton*

Available nitrogen = ammonia nitrogen + (30% of organic nitrogen)*

Available nitrogen = *23.2* *lb/ton + (0.30* x* *62.2* *lb/ton)*

Available nitrogen = *41.9* *lb/ton (copy this value into E above)*
** Use 15% for compost and advanced alkaline stabilized sludge.*

F. Agronomic rate *1.9 / 5.3* ***dry ton/acre. This value must be included on form SSA-5.***

Agronomic rate (dry weight basis) = additional nitrogen needs (D) ÷ available nitrogen in sludge (E)
Agronomic rate (dry weight basis) = *80 / 220* *lb/acre ÷* *41.9* *lb/ton*

Agronomic rate (dry weight basis) = *1.9 / 5.3* *dry ton/acre (copy this value into F above)*

APPENDIX E

AVAILABLE WATER CAPACITY CHART

Available Water Capacity Table

AVAILABLE WATER CAPACITY OF THE SOIL	SANDS AND LOAMY SANDS	SANDY LOAM AND FINE SANDY LOAM	VERY FINE SANDY LOAM, LOAM, SILT LOAM, SILTY CLAY LOAM	SANDY CLAY, SILTY CLAY, CLAY, FINE AND VERY FINE TEXTURED SOILS
NEAR 100% AVAILABLE WATER CAPACITY	DRY, LOOSE AND SINGLE-GRAINED; FLOWS THROUGH FINGERS.	DRY AND LOOSE; FLOWS THROUGH FINGERS.	POWDERY DRY; IN SOME PLACES SLIGHTLY CRUSTED BUT BREAKS DOWN EASILY INTO POWDER.	HARD, BAKED AND CRACKED; HAS LOOSE CRUMBS ON SURFACE IN SOME PLACES.
SOIL DEPTH AND AMOUNT TO REACH AWC	0-8" 27,000 / 0-24" 70,000	0-8" 27,000 / 0-24" 70,000	0-8" 40,000 / 0-24" 95,000	0-8" 27,000 / 0-24" 70,000
GREATER THAN 50% AVAILABLE WATER CAPACITY	APPEARS TO BE DRY; DOES NOT FORM A BALL UNDER PRESSURE.	APPEARS TO BE DRY; DOES NOT FORM A BALL UNDER PRESSURE.	SOMEWHAT CRUMBLY BUT HOLDS TOGETHER UNDER PRESSURE.	SOMEWHAT PLIABLE; BALLS UNDER PRESSURE.
SOIL DEPTH AND AMOUNT TO REACH AWC	0-8" 20,000 / 0-24" 55,000	0-8" 20,000 / 0-24" 55,000	0-8" 30,000 / 0-24" 70,000	0-8" 20,000 / 0-24" 55,000
25% TO 50% AVAILABLE WATER CAPACITY	APPEARS TO BE DRY; DOES NOT FORM A BALL UNDER PRESSURE.	BALLS UNDER PRESSURE BUT SELDOM HOLDS TOGETHER.	FORMS A BALL UNDER PRESSURE; SOMEWHAT PLASTIC; SLICKS SLIGHTLY UNDER PRESSURE.	FORMS A BALL; RIBBONS OUT BETWEEN THUMB AND FOREFINGER.
SOIL DEPTH AND AMOUNT TO REACH AWC	0-8" 13,000 / 0-24" 35,000	0-8" 13,000 / 0-24" 35,000	0-8" 20,000 / 0-24" 49,000	0-8" 13,000 / 0-24" 35,000
LESS THAN 25% AVAILABLE WATER CAPACITY	STICKS TOGETHER SLIGHTLY; MAY FORM A WEAK BALL UNDER PRESSURE.	FORMS A WEAK BALL THAT BREAKS EASILY, DOES NOT STICK.	FORMS BALL; VERY PLIABLE; SLICKS READILY IF RELATIVELY HIGH IN CLAY.	RIBBONS OUT BETWEEN FINGERS EASILY; HAS A SLICK FEELING.
SOIL DEPTH AND AMOUNT TO REACH AWC	0-8" 7,000 / 0-24" 16,000	0-8" 7,000 / 0-24" 16,000	0-8" 11,000 / 0-24" 25,000	0-8" 7,000 / 0-24" 16,000
NO AVAILABLE WATER CAPACITY	ON SQUEEZING, NO FREE WATER APPEARS ON SOIL, BUT WET OUTLINE OF BALL ON HAND.	ON SQUEEZING, NO FREE WATER APPEARS ON SOIL, BUT WET OUTLINE OF BALL ON HAND.	ON SQUEEZING, NO FREE WATER APPEARS ON SOIL, BUT WET OUTLINE OF BALL ON HAND.	ON SQUEEZING, NO FREE WATER APPEARS ON SOIL, BUT WET OUTLINE OF BALL ON HAND.
ABOVE FIELD CAPACITY	FREE WATER APPEARS WHEN SOIL IS BOUNCED IN HAND.	FREE WATER IS RELEASED WITH KNEADING.	FREE WATER CAN BE SQUEEZED OUT.	PUDDLES: FREE WATER FORMS ON SURFACE

APPENDIX F

OEPA SLUDGE SITE AUTHORIZATION PACKET

Ohio EPA

Sludge Site Authorization Packet for Non-EQ Sewage Sludge

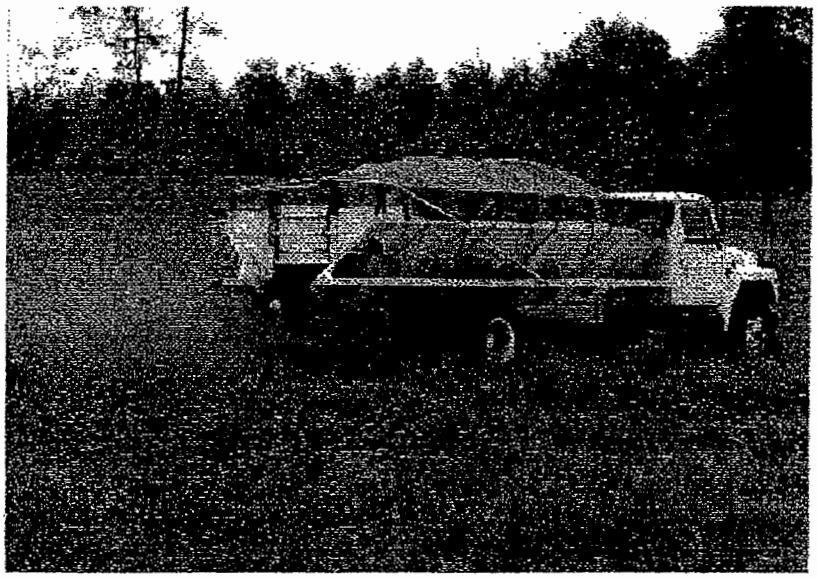

Photo courtesy of USDA Natural Resources Conservation Service

General Instructions - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Site authorization **must** be requested for each site proposed for sewage sludge land application. A site may consist of more than one field.

Read the following instructions carefully. These instructions should not be submitted with the application forms. Please retain them for future reference. Included with these instructions is a Nitrogen Agronomic Rate Worksheet, which should not be submitted with the application forms.

The following forms, with support documentation, should be submitted as an application packet:

Sludge Generator Summary (Form SSA-1)
Landowner Consent for Sludge Application (Form SSA-2)
Farm Operator Request and Consent for Sludge Application (Form SSA-3)
List of Fields (Form SSA-4)
Field Identification (Form SSA-5)
Field Soil Analysis (Form SSA-6)

The first three forms are related to the overall property. Only one copy of these forms needs to be submitted. The latter three forms relate to each individual field that may receive sewage sludge. One set of these forms must be submitted for **each** field. Copy the blank forms as needed.

Definitions - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

The following terms are defined to make the application clearer and easier to complete:

Land Owner:	The person who owns the legal rights to the property (pays taxes on the property).
Farm Operator:	The person who grows and manages the crops on the property.
Applicator:	The entity who applies the sludge to the property.
Farm:	The total property receiving the sludge, which may or may not contain more than one site or one field.
Authorized site:	An area of land bordered by fences, tree lines, streams, roads, or other means of demarcation, upon which sewage sludge is land applied.
Vicinity Map:	A portion of a United States Geological Survey 7.5 minute series topographic quadrangle map, scale 1:24,000 map which indicates the location of the field with respect to nearby highways and towns.
Soil Map:	A map which indicates the different types of soils present on the site. Soil maps may be obtained from the local Natural Resources Conservation Service office.
CPLR Sludge:	A sludge with a metals concentration which exceeds the Pollutant Monthly Average Concentrations of paragraph 3745-40-05(F)(3) of the Ohio Administrative Code, but which meets the Pollutant Ceiling Concentration requirements of paragraph 3745-40-04(F)(1) of the Ohio Administrative Code.
Isolation distance:	The distance to a specified object from the nearest edge of the sewage sludge application area (see Chapter 3745-40-04(N) of the Ohio Administrative Code).
Agronomic rate:	The whole sewage sludge application rate (dry weight basis) intended to provide the food crop, feed crop, fiber crop, cover crop, pasture, or vegetation the appropriate nitrogen for the reasonably expected yield, and to minimize the amount of nitrogen in the sewage sludge that passes to waters of the state.
Crop year:	The period of time for a particular crop to be planted and harvested, or one year's time, whichever is shorter.
Division:	The Ohio Environmental Protection Agency, Division of Surface Water, with any approvals or authorizations manifested through its Chief.

Detailed Instructions - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Use the checklist below to insure that all the necessary items are included. Incomplete packets **will not** be reviewed and will be returned to you for completion. All forms must be typed or printed clearly in ink. Word processor files of this packet may be requested via e-mail at the following address: chris.bowman@epa.state.oh.us .

❑ 1. Complete all information in the **Sludge Generator Summary** (form SSA-1).

❑ 2. Complete all landowner information in the **Landowner Consent For Sludge Application** (form SSA-2) and have the land owner of the property sign and date the form.

❑ 3. Complete all farm operator information in the **Farm Operator Request And Consent For Sludge Application** (form SSA-3) and have the farm operator of the property read, sign and date the form.

❑ 4. List all the field names for the site on the **List of Fields** (form SSA-4). **Do not** fill in the OEPA Site #, it will be completed by the OEPA upon authorization. Sites that do not get authorized will not receive an OEPA Site #, and will be left blank.

❑ 5. Complete the information on the **Field Identification** (SSA-5) for each field included on the **List of Fields** (form SSA-4). **Do not** fill in the OEPA Site #. Note special instructions on application rates (a Nitrogen Agronomic Rate Worksheet is included with these instructions).

❑ 6. Include a vicinity map for each field and insert them after the appropriate **Field Identification** (form SSA-5). Identify the mapped fields with the same field names as were used on the **List of Fields** (form SSA-4). The maps should be 8 ½-inch by 11-inch copies of the appropriate United States Geological Survey 7.5 minute series topographic quadrangle map, scale 1:24,000 (1-inch equals 2,000-feet). Identify the county where the field is located, and the name of the quadrangle map from which the vicinity map (or majority of the vicinity map where overlap occurs) was obtained. USGS 7.5 minute series maps can be ordered from the Ohio Department of Natural Resources from the following website: http://www.ohiodnr.com/geosurvey/pub/usgstopo.htm. Another source for USGS

topos are local Soil and Water Conservation District offices.

Alternatively, vicinity maps may be generated from the following websites:

http://www.topozone.com/, and

http://terraserver.homeadvisor.msn.com/default.asp

The "Advanced Find" feature of the Terrasaver site allows entry of an address to bring up an aerial photograph of a field. Once the field is located another feature of the site will switch the background to the USGS topo for that field.

There may be other similar sources for maps. The Ohio EPA requests vicinity maps be produced using this type of map source to enable a more efficient development of a GIS for the land application part of Ohio EPA's sewage sludge program.

❑ 7. Show the following features on the vicinity map for each field:

(1) Isolation distances from any waters of the state

(2) Isolation distances from any occupied building

(3) Isolation distances from any medical care facility

(4) Isolation distance from any private potable water source

(5) Isolation distance from any sinkhole or UIC Class V drainage well

[Note: Circumstances surrounding a field may change over time. New occupied buildings, wells, and other developments that require changes to existing isolation distances may occur. It is the responsibility of the sewage sludge generator, and their contractor, to note any changes that have occurred in the vicinity of an authorized site, and follow all required isolation distances accordingly. In other words, the isolation distances submitted with the site authorization application are a point in time, and subject to change.

❑ 8. The Division of Surface Water, in conjunction with the Division of Drinking and Groundwater, will determine if any of the proposed fields fall wholly, or partially, within a Groundwater Source Water Assessment and Protection area as described in paragraph 3745-40-04(O) of the Ohio Administrative Code.

Detailed Instructions - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

❑ 9. Complete all the information on the **Field Soil Analysis** (form SSA-6). Do not fill in the OEPA Site #. Background soil metals analysis is asked for to determine if previous unknown activity may have resulted in a contamination issue. Note: depth to bedrock information is available in county soil survey publications published by the United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with the Ohio Department of Natural Resources and the Ohio Agricultural Research and Development Center.

❑ 10. Include a soil map of each field from appropriate soil survey publication as mentioned above. Include after the appropriate **Field Soil Analysis** (form SSA-6). If soil maps are unavailable, please indicate this on the form.

❑ 11. Check to insure that all forms are filled out completely, and that all required forms and maps are included in the packet.

Sludge Generator Summary - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Sludge Generator: _____

Address: _____

_____

Phone No: (_____) _____ - _____

Plant Superintendent: _____

NPDES Permit No: _____

Responsible Official: _____

Title: _____

Land Owner(s): _____

Farm Operator(s): _____

Applicator: _____

Address: _____

_____

Contact: _____

Phone No: (_____) _____ - _____

I hereby agree that all contents of this package are, to the best of my knowledge, true and accurate.

_____ _____

Responsible Official Date

_____

Title

SSA-1

Landowner Consent for Sludge Application - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Owner(s) Name(s): _____

Address: _____

_____

Phone No: (_____) _____ - _____

Farm Location: _____

_____

Total Acres: _____ (Proposed for sludge application)

County: _____

Township: _____

1. I agree to allow sludge to be land applied to my property at agronomic rates.
2. I agree to allow federal, state and local regulatory staff access to my land for the purposes of inspecting and authorizing the site, applying sludge, obtaining samples from the site and testing. I reserve the right to ask the above parties for proper identification at any time.
3. This Consent may be terminated at any time by the landowner or farm operator.
4. I certify that I am holder of legal title to the above described property or am authorized by the holder to give consent for the land application of sludge and that there are no restrictions to the granting of consent under this form.

_____ _____

Owner Signature Date

_____

Title (If signing as the owners representative)

SSA-2

Farm Operator Request and Consent for Sludge Application - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Farm Operator: _____

Address: _____

_____

Phone No: (_____) _____ - _____

Farm Location: _____

Total Acres: _____ (proposed for sludge application)

County: _____

Township: _____

Crops: _____

I agree to be responsible for following the Site Restrictions of Chapter 3745-40-05(P) of the Ohio Administrative Code.

_____ _____

Farm Operator Signature Date

_____

(If signing as the farm operator's representative)

SSA-3

List of Fields - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Please fill out the site identification column for all the sites that are being proposed for sludge application.

Field Identification	Site # (Ohio EPA Use Only)

SSA-4

Field Identification - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Site#: _____
(OEPA Use Only)

Field Identification: _____

If known, Latitude: _____ Longitude: _____

Lat/Long reference point: _____

Has sludge been applied to this site since July 20, 1993 (Yes/No)? _____

If yes, list sources and years: _____

_____

Do you know of any endangered species or endangered species habitats located on the land application site (Yes/No)? _____

If yes, what is the endangered species or habitat: _____

_____

SSA-5

Field Soil Analysis - Sludge Site Authorization Packet for Non-EQ Sewage Sludge

Site #: _____
(OEPA Use Only)

Field Identification: _____

Laboratory Name: _____

Lab Contact: _____

Phone No: (____) _____ - _____

Size of Site: _____ acres

Soil pH: _____ S.U.

Soil CEC: _____ meg/100g

Bedrock Depth: _____ feet

Phosphorus: _____ ppm Bray-Kurtz P1 / Mehlich 3 (circle one)

Please submit the following information if available (Include lab report if available).

Arsenic: _____ mg/kg

Cadmium: _____ mg/kg

Copper: _____ mg/kg

Lead: _____ mg/kg

Mercury: _____ mg/kg

Molybdenum: _____ mg/kg

Nickel: _____ mg/kg

Selenium: _____ mg/kg

Zinc: _____ mg/kg

Soil Map: ❑ Included ❑ Unavailable

Soil Type(s): _____

SSA-6

APPENDIX G

SITE INSPECTION REQUEST FORM

Logan County Water Pollution Control
SITE INSPECTION REQUEST FORM FOR SLUDGE APPLICATION TO AGRICULTURAL LAND

COUNTY: _____ TOWNSHIP: _____ FIELD I.D. #: _____ LAT. & LONG: _____

DATE: **NAME, ADDRESS, & PHONE NUMBER of Following:**

SLUDGE GENERATOR	FARM OWNER(s)	FARM OPERATOR

SLUDGE INFORMATION:

1. Type of sludge to be applied:
   a. Municipal_____ Secondary_____ Combination _____
   Describe:_____
   b. Form (liquid, thickened, dewatered, etc.) _____ Percent Solids: _____
2. Method of Pathogen Reduction: Class A _____ Class B_____ _____
3. Method of Stabilization (Vector Attraction Reduction): Option Number _____ _____

PROPOSED APPLICATION DETAILS:

1. Anticipated dates of application: _____
2. Applicator: _____ Method of Application: _____
3. Soil Treatment:
   a. Before Application: _____
   b. After Application: _____
4. Type of crop on field at time of application: _____
   Type of crop to planted after application: _____
5. Previous sludge application: *YES/NO* Dates: _____
   Estimated Rate: _____ tons/acre x 2.24 = _____ metric tons/hectare.
6. Approximate annual application rate: _____ tons/acre x 2.24 = _____ metric tons/hectare.
   Quantity to be applied per crop year: _____ tons/acre x 2.24 = _____ metric tons/hectare.
7. Rate limiting factor (metals, dry weight/acre, dioxin, other) _____
8. If an aquifer system is within 10 feet of the surface, what is the surface soil percolation rate? _____ inches/hour.

SITE DETAILS:

1. Total number of acres & hectares proposed for application: _____ acres x 0.405 = _____ hectare.
2. Endangered species or endangered species habitat(s): (not necessary to do site assessment for agricultural land currently or recently in production, but if known, list endangered species/habitat in such a situation) _____
3. Attach a legible road map (e.g. county map) which shows the farm location. Show areas of spreading on 8½" x 11" section of a topographic USGS map or SCS map (attached).
4. Attach plan of sludge application site drawn to scale that is approximately 1 inch = 500 feet, or less, that clearly shows:
   a. Outline of the farm property lines.
   b. Location of residences on the farm and neighbor-occupied buildings within 1,000 feet of application area.
   c. Location of roads on or near the site.
   d. Location of all public and private wells on-site and within 1,000 feet of the site.
   e. Number of acres in each field used.
   f. Give maximum slope on each field.
   g. Location of springs, surface drainage swales, ponds, lakes, grass waterways, ditches, streams, and flood prone areas on or near to the site, and isolation distances provided; uses of such waters (indicate on attachment).
   h. Note soil pH (range), soil types on each field, depth to ground water, plus type of and depth to bedrock.
   i. Show actual area to be spread on each field.
   j. Include a north arrow.
   k. Location of any proposed storage or transfer sites.
   l. A map legend that explains the symbols, colors, and scale used.
5. Attach copies of well logs from the area.

SUBMITTED BY: _____ **DATE:** _____ **TELEPHONE NUMBER:** _____

APPENDIX H

LANDFILL PARAMETERS & ANALYSES REQUIREMENTS

LAIDLAW WASTE SYSTEM, INC.
LANDFILLPARAMETER ANALYSIS REQUIREMENTS

PARAMETER	Maximum Allowable Levels (mg/l)	*ANALYTICAL METHODS
General		
pH	2.0< X< 12.5 S.U.	SW-846-9045
TPH (Total Petroleum Hydrocarbons)	Varies	SW-846-8015, EPA 418.1
Reactivity to Cyanide:	< 250 mg/kg or ppm	SW-846-C7
Reactivity to Sulfide:	< 500 mg/kg or ppm	SW-846-C7
Paint Filter Test	Pass	SW-946-9095
TCLP Metals:		
- Arsenic, As:	< 5.0	SW-846-1311/SW-846-6010
- Barium, Ba:	< 100.0	SW-846-1311/SW-846-6010
- Cadmium, Cd:	< 1.0	SW-846-1311/SW-846-6010
- Lead, Pb:	< 5.0	SW-846-1311/SW-846-6010
- Mercury, Hg:	< 0.2	SW-846-1311/SW-846-7470
- Selenium, Se:	< 1.0	SW-846-1311/SW-846-7740
- Silver, Ag:	< 5.0	SW-846-1311/SW-846-6010
TCLP Volatiles:		
Benzene	< 0.5	SW-846-1311/SW-846-8260
Carbon Tetrachloride	< 0.5	SW-846-1311/SW-846-8260
Chlorobenzene	< 100.0	SW-846-1311/SW-846-8260
Chloroform	< 6.0	SW-846-1311/SW-846-8260
1,2-Dichloroethane	< 0.5	SW-846-1311/SW-846-8260
1,1-Dichloroethylene	<).7	SW-846-1311/SW-846-8260
Methyl Ethyl Ketone	< 200.0	SW-846-1311/SW-846-8260
Tetrachloroethylene	< 0.7	SW-846-1311/SW-846-8260
Trichloroethylene	< 0.5	SW-846-1311/SW-846-8260
Vinyl Chloride	< 0.2	SW-846-1311/SW-846-8260
TPCL Semi-Volatives(Base Neutrals)		
1,4-Dichlorobenzene	< 7.5	SW-846-1311/SW-846-8270
Hexachlorobenzene	< 0.13	SW-846-1311/SW-846-8270
Hexachlorobutadiane	< 0.5	SW-846-1311/SW-846-8270
Hexachloroethane	< 3.0	SW-846-1311/SW-846-8270
Nitobenzene	< 2.0	SW-846-1311/SW-846-8270
Pyridine	< 5.0	SW-846-1311/SW-846-8270
2,4-Dinitrotoluene	< 0.13	SW-846-1311/SW-846-8270
TPCL Semi-Volatives(AcidCompounds)		
o-Creosol	< 200.0	SW-846-1311/SW-846-8270
m-Creosol	< 200.0	SW-846-1311/SW-846-8270
p-Creosol	< 200.0	SW-846-1311/SW-846-8270
Creosol, Total	< 200.0	SW-846-1311/SW-846-8270
Pentachlorophenol	< 100.0	SW-846-1311/SW-846-8270
2,4,5-Trichlorophenol	< 400.0	SW-846-1311/SW-846-8270
2,4,6-Trichlorophenol	< 2.0	SW-846-1311/SW-846-8270

* Suggested methods; other methods may be utilized.

APPENDIX I

DAILY BIOSOLIDS APPLICATION SHEET

DAILY SLUDGE APPLICATION SHEET

DATE:	_____	% TOT.SOLIDS:	_____	LABOR: Reg. Hrs.:	_____
OPERATOR:	_____	% VOL. SOLIDS:	_____	LABOR: OT Hrs.	_____
FIELD #:	_____	*DRY LBS.:	_____	MILEAGE/HRS:	_____
# OF LOADS:	_____	**DRY TONS:	_____	ENDING:	_____
CU. YARDS:	_____	pH:	_____	BEGINNING:	_____
LOADER FUEL:	_____	TRACTOR FUEL:	_____	TOTAL:	_____

7.0 CUBIC YARDS per LOAD/TRACTOR SPREADER

***# of Loads_____ x 7.0 cuyd./Load x 27 cuft/yd. x 7.48 gal/cuft x 8.34 lb/gal x ._____ % solids = _____ dry lbs**

****_____ dry lbs ÷ 2000 = _____ dry tons**

FIELD IDENTIFICATION & LOCATION

_____

_____

_____

_____

NOTES/COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX J

OEPA APPROVED LABORATORIES FOR DIOXIN, DIBENZOFURAN AND COPLANER PCB ANALYSES

OEPA DIOXIN, DIBENZOFURAN AND COPLANER PCB REPORT FORM

Partial List of Laboratories Capable of Analyzing Sewage Sludge for "Dioxins"

USEPA Method No. 1613b - Tetra though Octa Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry (USEPA Method 1613b may be obtained from the National Technical Information Service No. PB93-236024; or, Educational Resources Information Center No. W–105). This does not represent a complete list of laboratories capable of performing this test, nor does it constitute endorsement by Ohio EPA.

Alta Analytical
5070 Robert J. Matthews Pkwy, Suite 2
Eldorado Hills, CA 95630
(916) 933-1640

Axys Analytical Services
P.O. Box 2219, 2045 Mills Road West
Sidney, British Columbia, CANADA V8L3S8
(250) 655-5800
(250) 655-5811 FAX

Battelle Columbus Laboratories
505 King Ave.
Columbus, OH 43201
(614) 424-4028
(614) 424-4976

Brehm Research Laboratories
Wright State University
Dayton, OH 45435
(937) 775-2202
(937) 873-3807 FAX

Chemserv Industrie Service Ges.mb.H
St. Peter Strasse 25
P.O. Box 296
A-4021 Linz (Austria)
0043-0732-5917-3771

CNRS Service Central D'Analyse
Spectometrie De Masse
Echangeur de Solaise-Chemin du Canal
B.P. 22-69390 Vernaison France
011-33-7802-2291

Columbia Analytical Services
10655 Richmond Avenue, Suite 130A
Houston, TX 77042
(713) 266-1599

Diverse Analyticals Limited
5 Chesterfield Road
Newbury Berks RG14 7QB England
011-44-061-876-4220

Environment Canada
Chemistry Division, Technology Development Branch
River Road Environmental Technology Centre
Ottawa, Ontario, CANADA K1AOH3
(613) 998-3671

Enviro-Test Laboratories
9936 67th Avenue
Edmonton, Alberta, CANADA T6E0P5
(780) 413-5203

Midwest Research Institute
425 Volker Boulevard
Kansas City, MO 64110
(816) 753-7600

New York State Department of Health
Wadsworth Laboratories, Empire State Plaza
P.O. Box 509
Albany, NY 12201-0509
(518) 474-4151

Pace Analytical Services Incorporated
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(765) 778-0201 Mike King
(612) 607-1700

Pacific Analytical, Inc.
6349 Paseo del Lago, Suite 102
Carlsbad, CA 92008
(760) 438-3100

Quanterra
880 Riverside Parkway
W. Sacramento, CA 95605
(916) 374-4408

Severn Trent Laboratories Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
(916) 373-5600
(916) 372-1059 FAX

Severn Trent Laboratories Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921-5947
(865) 291-3000
(865) 584-4315 FAX

Southwest Research Institute
6220 Culebra Rd.
San Antonio, TX 78238
(210) 522-5428

Triangle Laboratories
P.O. Box 13485
Research Triangle Park, NC 27709-3485
(919) 544-5729
(919) 544-5491 FAX

Triangle Laboratories
801 Capitola Dr.
Durham, NC 27713-4411

University of Umea
Institute of Environmental Chemistry
Umea Sweden 5-90187
011-46-90-165266

US EPA EMSL
944 East Hammon Avenue
Las Vegas, NV 89109

Wellington Environmental Consultants
395 Laird Road
Guelph, Ontario, CANADA N1G3X7
(519) 822-2436

USEPA Method 1668a - Polychlorinated Biphenyls by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry (USEPA Method 1668a may be obtained from United States EPA, Office of Water Resource Center). This does not represent a complete list of laboratories capable of performing this test, nor does it constitute endorsement by Ohio EPA.

Alta Analytical
5070 Robert J. Matthews Pkwy, Suite 2
Eldorado Hills, CA 95630
(916) 933-1640

Axys Analytical Services Ltd.
P.O. Box 2219, 2045 Mills Road West
Sidney, British Columbia, CANADA V8L3S8
(250) 655-5800
(250) 655-5811 FAX

Battelle-Columbus Laboratories
505 King Avenue
Columbus, OH 43201
(614) 424-4028
(614) 424-4976

Columbia Analytical Services
1317 S 13th Avenue
Kelso, WA 98626-2845
(360) 577-7222

Enviro-Test Laboratories
9936 67th Avenue
Edmonton, Alberta, CANADA T6E0P5
(780) 413-5203

Midwest Research Institute
425 Volker Boulevard
Kansas City, MO 64110
(816) 753-7600

Pace Analytical Services Incorporated
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(765) 778-0201 Mike King
(612) 607-6387

Pacific Analytical
6349 Paseo del Lago, Suite 102
Carlsbad, CA 92008
(760) 438-3100

Quanterra
880 Riverside Parkway
W. Sacramento, CA 95605
(916) 374-4408

Southwest Research Institute
6220 Culebra Rd.
San Antonio, TX 78238
(210) 522-5428

Triangle Laboratories
P.O. Box 13485
Research Triangle Park, NC 27709-3485
(919) 544-5729
(919) 544-5491 FAX

Triangle Laboratories
801 Capitola Dr.
Durham, NC 27713-4411

Sludge Dioxin, Dibenzofuran and Coplanar PCB Worksheet

Facility Name and Address:	Laboratory Name and Address:
Facility NPDES Permit No.:	Laboratory Sample No./Date:

2,3,7,8-TCDD TTE	85865	2,3,7,8-TCDD Total Toxicity Equivalence for all dioxins, dibenzofurans, and coplanar PCBs in Part B (ng/kg)	
Additional Remarks:			
I certify under penalty of law that I have personally examined, and am familiar with the information submitted, and based on my inquiry of those individuals immediately responsible for obtaining the information I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.			
Date Completed:	Signature and Title:		

Instructions:

(A) Record the concentration of each parameter in nanograms per kilogram (ng/kg).

(B) The concentration recorded for parameters that are below the detection limit shall be one-half of the detection limit (ng/kg).

(C) Multiply the concentration by the given TEF and record the answer in the TE column (ng/kg).

(D) Sum all of the individual TE's. That sum is the 2,3,7,8-TCDD Total Toxicity Equivalence (TTE). Record that value in the appropriate box (ng/kg).

(E) Report must be signed by the sludge generator's responsible individual (not an employee of the testing laboratory). Call (614) 644-2134 with any questions.

Abbreviations:

TCDD = tetrachlorodibenzo-p-dioxin	TCDF = tetrachlorodibenzofuran	TCB = tetrachlorobiphenyl
PeCDD = pentachlorodibenzo-p-dioxin	PeCDF = tetrachlorodibenzofuran	PeCB = pentachlorobiphenyl
HxCDD = hexachlorodibenzo-p-dioxin	HxCDF = tetrachlorodibenzofuran	HxCB = hexachlorobiphenyl
HpCDD = heptachlorodibenzo-p-dioxin	HpCDF = tetrachlorodibenzofuran	HpCB = heptachlorobiphenyl
OCDD = octachlorodibenzo-p-dioxin	OCDF = tetrachlorodibenzofuran	
TEF = Toxicity Equivalence Factor	TE = Toxicity Equivalence	TTE = Total Toxicity Equivalence

Sludge Dioxin, Dibenzofuran and Coplanar PCB Worksheet

Parameter	MOR Reporting Code	Concentration (ng/kg)	TEF	TE (ng/kg)
Total TCDD	85827			
Total PeCDD	85828			
Total HxCDD	85829			
Total HpCDD	85830			
Total TCDF	85832			
Total PeCDF	85833			
Total HxCDF	85834			
Total HpCDF	85835			
2,3,7,8-TCDD	85837		1	
2,3,7,8-TCDF	85838		0.1	
1,2,3,7,8-PeCDD	85839		0.5	
1,2,3,7,8-PeCDF	85840		0.05	
2,3,4,7,8-PeCDF	85841		0.5	
1,2,3,4,7,8-HxCDD	85842		0.1	
1,2,3,6,7,8-HxCDD	85843		0.1	
1,2,3,7,8,9-HxCDD	85844		0.1	
1,2,3,4,7,8-HxCDF	85845		0.1	
1,2,3,6,7,8-HxCDF	85846		0.1	
1,2,3,7,8,9-HxCDF	85847		0.1	
2,3,4,6,7,8-HxCDF	85848		0.1	
1,2,3,4,6,7,8-HpCDD	85849		0.01	
1,2,3,4,6,7,8-HpCDF	85850		0.01	
1,2,3,4,7,8,9-HpCDF	85851		0.01	
OCDD	85831		0.001	
OCDF	85836		0.001	
3,3',4,4'-TCB	85852		0.0001	
3,4,4',5-TCB	85853		0.0001	
3,3',4,4',5-PeCB	85854		0.1	
2,3,3',4,4'-PeCB	85855		0.0001	
2,3',4,4',5-PeCB	85856		0.0001	
2',3,4,4',5-PeCB	85857		0.0001	
2,3,4,4',5-PeCB	85858		0.0005	
3,3',4,4',5,5'-HxCB	85859		0.01	
2,3,3',4,4',5-HxCB	85860		0.0005	
2,3,3',4,4',5'-HxCB	85861		0.0005	
2,3',4,4',5,5'-HxCB	85862		0.00001	
2,3,3',4,4',5,5'-HpCB	85864		0.0001	
2,3,7,8-TCDD TTE	85865			

APPENDIX K

SOIL PHOSPHORUS INDEX WORKSHEET

Phosphorus Index Methodology

Nitrogen and phosphorus are the two nutrients most often associated with the impairment of the quality of our groundwater and surface water. Nitrogen leaching out of the root zone may enter a tile and be transported to surface water, or it may leach to the groundwater. The Ohio EPA Drinking Water Maximum Contaminant Level for nitrate is 10 mg/L. Phosphorus leachate, or runoff entering the surface water, may contribute to excessive algae growth which may cause low oxygen levels in surface water. This in turn may impair aquatic life and adversely affect the taste of the water.

To supply the needed nutrients to achieve realistic yield goals, and minimize the transport of nitrogen and phosphorus to ground and surface water, Ohio's sewage sludge rules have adopted a nitrogen agronomic limit, and the use of a Phosphorus Index Risk Assessment Procedure developed by the Ohio Natural Resources Conservation Service (NRCS). The rule requirements are designed to assist the planner and the producer to identify fields or areas of a field that have varying risks of nutrient transport and assist in nutrient management to minimize nutrient transport and achieve production goals.

The Phosphorus Index is a procedure that combines well established factors that influence the transport of phosphorus to surface waters. Each of the factors is evaluated based on site specific data and weighted according to its overall effect on phosphorus transport. Each of the site subvalues are added together to establish an overall site rating of Low, Moderate, High, or Very High risk.

Use the Phosphorus Index Assessment Procedure Worksheet to determine the site's overall Phosphorus Index. Use the following guidance to determine each of the site's subvalues. The subvalues are added together to determine the overall site Phosphorus Index. A Field Summary Worksheet is also provided to record a series of site/field values for a given farm.

1. Sheet and rill erosion, as measured by the most current version of the Revised Universal Soil Loss Equation (RUSLE) or Wind Erosion Prediction Procedure (where wind erosion is the primary concern), determines the predicted soil loss from erosion. Determine the predicted soil loss in tons per acre per year (tons/ac/yr) and multiply by 1.0 to determine the soil loss site subvalue. Ohio EPA recommends working with local Ohio NRCS offices to develop site specific soil loss predictions using RUSLE or the Wind Erosion Prediction Procedure. Local Ohio NRCS office information is available at www.oh.nrcs.usda.gov .

2. The runoff class represents the effect of the Hydrologic Soil Group (A, B, C, D) combined with the effect of slope. This factor represents the site's runoff vulnerability. Use the table below to determine the runoff class. The runoff class is the site's subvalue.

Table 1: Runoff Class Determination

	Hydrologic Soil Group			
Slope Range	A	B	C	D
<1 %	0	1	3	6
1-3%	1	2	4	7
4-6%	2	3	5	8
7-10%	3	5	7	10
11-15%	4	6	9	12
>15%	6	8	11	15

3. Connectivity to water defines the vulnerability of phosphorus to be transferred to waters of the state. The more closely connected the runoff is from the field via concentrated flow (from a defined grassed waterway or surface drain) to waters of the state the higher the vulnerability of phosphorus transport. To determine the "connectivity to water" site subfactor ask the question: Does concentrated flow (via a defined waterway, tile inlet, or surface drain) leave the site? Read the value definitions to determine the site's "connectivity to water" subvalue.

4. The soil phosphorus test procedure, using the Bray-Kurtz P1 extraction, provides an index of plant available P expressed in parts per million (ppm). Determine the Bray-Kurtz P1 in ppm and multiply the ppm by 0.07 to determine the site soil phosphorus subvalue.
   a. To convert from Bray-Kurtz P1 in pounds per acre to Bray-Kurtz P1 in ppm, divide the pounds per acre value by 2.
   b. To convert from Mehlich 3 in ppm to Bray-Kurtz P1 in ppm, multiply the Mehlich 3 value by 0.88.
   c. To convert from Mehlich 3 in pounds per acre to Bray-Kurtz P1 in ppm, divide the Mehlich 3 value by 2, and multiply the number from that operation by 0.88.

FAQ: What if the lab results say something like >250 ppm Bray-Kurtz P1? *Explain to the lab that these results are not to determine if there is adequate soil phosphorus for the next crop, but to determine the actual soil phosphorus level. You need an accurate determination of the soil phosphorus level.*

5. The fertilizer P_2O_5 application rate is the amount of manufactured (commercial) phosphate fertilizer applied to the site expressed in pounds per acre (lbs/ac) of P_2O_5. To determine the site's subvalue multiply the year's fertilizer P_2O_5 application

rate (lbs/ac) by 0.05.

6. The fertilizer P_2O_5 application method defines if fertilizer P_2O_5 is actually incorporated into the soil, and the time interval between application and incorporation, or if the fertilizer P_2O_5 is applied over a given amount of crop residue. Incorporation is either through direct injection with the fertilizer application equipment or using a tillage tool operated a minimum of 3-4 inches deep to incorporate the fertilizer P_2O_5. To determine the site's subvalue select the description that most closely describes the method of application. The value with that description is the site's subvalue.

7. The organic P_2O_5 application rate defines the amount of organic P_2O_5 applied, in pounds per acre (lbs/ac) of P_2O_5, from manure, sewage sludge, etc. To determine the site's subvalue multiply the year's organic P_2O_5 fertilizer application rate (lbs/ac) by 0.06.

8. Organic P_2O_5 application method defines if the organic P_2O_5 from the manure, sewage sludge, etc., is incorporated into the soil, the time interval between application and incorporation, or if the organic P_2O_5 is applied over a given amount of crop residue. Incorporation is either through direct injection with the application equipment or by using a tillage tool operated a minimum of 3-4 inches deep to incorporate the manure, sewage sludge, etc. To determine the site's subvalue select the description that most closely describes the method of application. The value with that description is the site's subvalue.

9. Deduct 2 points if field runoff flows via sheet flow through a designed grassed waterway.

Phosphorus Index Risk Assessment Procedure Worksheet						
Site Characteristic	Phosphorus Vulnerability Values					Site Subvalue
1. Soil Erosion	Soil Loss (tons/acre/year) X 1.0					
2. Connectivity to Water. Does concentrated flow (via a defined waterway, tile inlet, or surface drain) leave the site?	NO, and the site is not adjacent to an intermittent or perennial stream. Value = 0	NO, but the site is adjacent to an intermittent or perennial stream. Value = 4.0	Yes, but the site is not adjacent to an intermittent or perennial stream. Value = 8.0	Yes, and the site is adjacent to and/or the concentrated flow outlets into an intermittent stream or through a tile inlet. Value = 12.0	Yes, and the site is adjacent to and/or the concentrated flow outlets into a perennial stream or through a tile inlet; or outlets to a pond or lake within 1 mile. Value = 16.0	
Runoff Class	From Runoff Class Table					
4. Soil Test Bray-Kurtz P1 (ppm)	Bray – Kurtz P1 (ppm) X (0.07)					
5. Fertilizer P_2O_5 Application Rate	Fertilizer P_2O_5 applied (lbs/acre) X (0.05)					

Phosphorus Index Risk Assessment Procedure Worksheet Continued						
6. Fertilizer P_2O_5 Application Method	None applied. Value = 0	Immediate incorporation or applied on ≥80% cover. Value = 0.75	Incorporation in ≤1 week or applied on 50% to 80% cover. Value = 1.5	Incorporation in >1 week and ≤3 months or applied on 30% to 49% cover. Value = 3.0	No incorporation or incorporation >3 months or applied on <30% cover. Value = 6.0	
7. Organic P_2O_5 Application Rate	Available organic P_2O_5 applied (lbs/acre) X (0.06)					
8. Organic P_2O_5 Application Method	None applied. Value = 0	Immediate incorporation or applied on ≥80% cover. Value = 0.5	Incorporation in ≤1 week or applied on 50% to 80% cover. Value = 1.0	Incorporation in >1 week and ≤3 months or applied on 30% to 49% cover. Value = 2.0	No incorporation or incorporation >3 months or applied on <30% cover. Value = 4.0	
Deduct 2 points if field runoff flows through a designed grassed waterway.						
Total Phosphorus Index Value for the Site						

Phosphorus Index Field Summary											
Name:	Farm:										
	Field Identification										
Site Characteristic											
1. Erosion (Value)											
2. Connectivity to Water (Value)											
3. Runoff Class (Value)											
4. Soil Phosphorus (Value)											
5. Fertilizer P_2O_5 Rate (Value)											
6. Fertilizer P_2O_5 Method (Value)											
7. Organic P_2O_5 Rate (Value)											
8. Organic P_2O_5 Method (Value)											
9. Grassed Waterway (-2 if present)											
Total Field Score											
Field Rating (L, M, H, VH)											

Field Vulnerability for Phosphorus Loss to Surface Water	
Phosphorus Index	Generalized Interpretation of Phosphorus Index & Management
< 15 = Low	Low potential for phosphorus movement from the field. If farming practices are maintained at the current level there is a low probability of an adverse impact to waters of the state from phosphorus loss. Sewage sludge can be applied to meet the recommended nitrogen for the next grass crop or nitrogen removal of the next legume crop.
15 to 30 = Medium	Medium potential for phosphorus movement from the field. The chance of organic material and nutrients getting into waters of the state exists. Runoff reduction practices such as buffers, setbacks, cover crops, and crop residue practices alone or in combination should be considered to reduce phosphorus loss impacts. Sewage sludge can be applied to meet the recommended nitrogen for the next grass crop or nitrogen removal of the next legume crop. Application of phosphorus at the crop removal rate should be considered.
31 to 45 = High	High potential for phosphorus movement from the field and for an adverse impact on waters of the state unless remedial action is taken. Runoff reduction practices such as buffers, setbacks, cover crops, and crop residue practices alone or in combination should be considered to reduce phosphorus loss impacts. Sewage sludge application rate shall be limited to the phosphorus crop removal rate.
>45 = Very High	Very high potential for phosphorus movement from the field and an adverse impact on waters of the state. Remedial action is required to reduce the risk of phosphorus loss. A complete soil and water conservation system is needed. Land application of sewage sludge is prohibited.

APPENDIX L

MONTHLY REPORT

MONTHLY REPORT

LAND APPLICATION OF SLUDGE/MONTHLY ACTIVITY REPORT Month/Yr:_____
This form is to be used to report all land application of sludge activity for a calendar month. Reports are required every month sludge is land applied and are due by the 15th of the following month.

Generator Name:_____OEPA Permit No._____

County:_____ Contractor(s) Used:_____

Maximum Liquid Loading Rate:_____gal/ac/day, [8] x 0.00935 = _____m^3/ha/day

Maximum Solids Loading Rate:_____tons/ac/day, [9] x 2.24 =_____metric ton/day

Maximum Length of Time Sludge Stockpiled: _____days. [10]

(1) Month/Day Start/Finish	(2) Field No./ Acres (Ha*)	(3) Acres (Ha*) Used	(4) Sludge Source	(5) Total Applied Tons (met.tons*)	(6) Incorporated Y/N Days	(7) Limiting Pollutant Info. Lbs/ac P	C. Limit	Total
	( )			( )				
	( )							
	( )							
	( )							
	( )							
	( )							
	( )							
	( )							
	( )							
	( )							

(1) First and last day during the month sludge was applied to a particular field.
(2) Use the same field identification number in the approved management plan, or OEPA's site authorization letter and the area of the field in acres.
(3) Total acres in the field that received sludge.
(4) Use sampling station number as specified in the NPDES permit, e.g. 582.
(5) Total quantity of sludge applied to the field this month.
(6) Indicate if the sludge was incorporated (y or n) and the number of days sludge was on the field unincorporated. Enter "0" if sludge was immediately incorporated.
(7) Indicate the limiting metal pollutant, e.g. "Zn", ; the cumulative limit (kg/ha) and the total applied to the field to date (kg/ha). NOTE: # lb/ac x 1.12 will give you kg/ha.
(8) Indicate the maximum liquid application rate.
(9) Indicate the maximum solid loading rate.
(10) Indicate the maximum length of time sludge was stockpiled. If no sludge was stockpiled, report "0".

* # acres x 0.405 = hectares (ha). # tons/1.1 = metric tons.

SLUDGE:

2,3,7,8-TCDD _____
2,3,7,8-TCDD _____
2,3,7,8-TCDF _____
ARSENIC _____
CADMIUM _____
CHROMIUM _____
COPPER _____
LEAD _____
PERCENT SOLIDS _____

TEO _____
DETECTION LIMIT _____
DETECTION LIMIT _____
MERCURY _____
MOLYBDENUM _____
NICKEL _____
SELENIUM _____
ZINC _____

ATTACHMENTS:

___ CHAIN OF CUSTODY DOCUMENT
___ PRIORITY POLLUTANT EVALUATION
___ VOLATILES
___ ACID EXTRACTABLES
___ BASE NEUTRAL EXTRACTABLES
___ PCB'S
___ OTHER

I certify under penalty of law that the above information is true and accurate and complete and I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Date Report Completed	Signature of Reporter	Title of Reporter

APPENDIX M

CERTIFICATION STATEMENTS

CERTIFICATION STATEMENTS FOR RECORD KEEPING

The person who prepares and/or derives an Exceptional Quality Sludge shall retain the following certification statement:

"I certify, under penalty of law, the Class A pathogen requirements in 503.32(a) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in 503.33(b)(1) through 503.33(b)(8)] have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

When sewage sludge is sold or given away in a bag or other container for application to the land, the person who prepares the sewage sludge that is sold or given away in a bag or other container shall retain the following certification statement:

I certify, under penalty of law, that the management practice in 503.14(e), the Class A pathogen requirement in 503.32(a), and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in 503.33(b)(1) through 503.33(b)(8)] have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practice, pathogen requirements, and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine imprisonment."

The person who prepares a Class A sewage sludge that meets Table 3 metal limits when a Vector Attraction Reduction Option 9 or 10 is used shall retain the following certification statement:

"I certify, under penalty of law, that the pathogen requirements in 503.32(a) have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

The person who applies a Class A sewage sludge that meets Table 3 metal limits when a Vector Attraction Reduction Option 9 or 10 is used, shall retain the following certification statement:

"I certify, under penalty of law, that the management practices in 503.14 and the vector attraction reduction requirement in [insert either 503.33(b)(9) or 503.33(b)(10)] have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

The person who prepares a Class B sewage sludge that meets Table 3 metal limits when a Vector Attraction Reduction Option 1 - 8 is used, shall retain the following certification statement:

"I certify, under penalty of law, that the Class B pathogen requirements in 503.32(b) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in 503.33(b)(1) through 503.33(b)(8) if one of these requirements is met] have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements [and vector attraction reduction requirement is applicable] have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

The person who prepares a Class B sewage sludge that meets Table 3 metal limits when a Vector Attraction Reduction Option 9 or 10 is used, shall retain the following certification statement:

"I certify, under penalty of law, that the management practices in 503.14, the site restrictions in 503.32(b)(5), and the vector attraction reduction requirements in [insert either 503.33(b)(9) or 503.33(b)(10) if one of those requirements is met] have been met for each site on which bulk sewage sludge is applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices and site restrictions [and the vector attraction reduction requirements if applicable] have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

The person who prepares a sewage sludge subject to cumulative pollutant loading rates shall retain the following certification statement:

"I certify, under penalty of law, that the pathogen requirements [insert either 503.32(a) or 503.32(b)] and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in 503.33(b)(1) through 503.33(b)(8) if one of those requirements is met] have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements [and vector attraction reduction requirements] have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

The person who applies a sewage sludge subject to cumulative pollutant loading rates shall retain the following certification statements:

1. "I certify, under penalty of law, that the requirements to obtain information in 503.12(e)(2) have been met for each site on which bulk sewage sludge is applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the requirements to obtain information have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

2. "I certify, under penalty of law, that the management practices in 503.14 have been met for each site on which bulk sewage sludge is applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

3. (For Class B): "I certify, under penalty of law, that the site restrictions in 503.32(b)(5) have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the site restrictions have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

4. (Where a Vector Attraction Reduction Requirement 9 or 10 is used): "I certify, under penalty of law, that the vector attraction reduction requirement in [insert either 503.33(b)(9) or 503.33(b)(10) has been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the vector attraction reduction requirement has been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

FLOYD BROWNE ASSOCIATES, FBA INC.

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Suite 200
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740.383.2187
Fax 740.382.1420

e-mail: fba@fbainc.com
www.floydbrowne.com

February 7, 2005

Logan County
1211-62

Mr. Garis Pugh
General Manager
Logan County Water Pollution Control
P.O. Box 1550
1015 South Orchard Island Road
Russells Point, Ohio 43348

Dear Mr. Pugh:

Subject: Wastewater Master Plan
Indian Lake Water Pollution Control Plant

Floyd Browne Associates, Inc. is pleased to submit **six (6) copies** of the "Wastewater Master Plan."

We appreciate the opportunity to provide professional engineering services to Logan County Water Pollution Control and look forward to assisting you in completing the recommendations that are contained in the report. If you have any questions or comments, please do not hesitate to contact us.

Sincerely,

Michael P. Davis, P.E.
Project Manager

Keith A. Radick
Vice President

Enclosures

DEFENDANT'S EXHIBIT 15

K:\L\Logan County\WWTP\1211-62 Master Plan '04\Cover Letter.doc

FLOYD BROWNE ASSOCIATES, FBA INC.

Indian Lake WPCP Master Plan

January 2005

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CHAPTER ONE

INTRODUCTION

PURPOSE OF REPORT

The Logan County Water Pollution Control's (LCWPC) Indian Lake facility is approaching the end of its twenty year design life. In December 2003, Logan County authorized Floyd Browne Associates, Inc. (FBA) to perform a master plan for the Indian Lake facility. The purpose of this report is to provide an evaluation and recommendations to improve the Indian Lake Water Pollution Control facility to meet predicted future regulatory requirements.

HISTORY

The original facilities constructed at the current site were completed in the late 1980s. In March of 2003, Floyd Browne Associates, Inc. (FBA) prepared a Biosolids Management Plan (BMP) for the Logan County Water Pollution Control's (LCWPC) Indian Lake treatment facility as required under the facility's NPDES Permit Compliance Schedule. During the investigation for the management plan, difficulties developing operating criteria surfaced and the Logan County operations staff mentioned several items in the sludge train that had historically been perceived as impairing proper operation of the system. Management decided that a third party overview of the entire solids handling system was warranted for the Indian Lake Facility. Of note is the fact that, at approximately twenty years of age, the plant is approaching the end of its design life.

In July of 2003, FBA prepared a Solids Evaluation Report that pointed out some short-term objectives to meet current biosolids regulations. However, through the course of the

investigation, it became obvious that other factors were directly related to the solids challenges, such as preliminary treatment and clarification, and that a long-term solution was required to meet the regulations that the County will be facing in the next twenty years.

In discussing the future peak flow sizing of the treatment train, County staff noted that the collection system surcharges and actual peak flows were higher than those recorded at the plant. In August of 2004, FBA performed a metering study to predict the actual peak flow entering the facility. The findings of the study have been documented and the findings will be used in estimating the peak flows for the upgrade.

PREVIOUS REPORTS

As previously noted, the County has participated in several studies over the past couple of years to improve the operation of the Water Pollution Control Facility (WPCF). Many of these plans addressed short-term fixes to current challenges at the plant instead of addressing future regulatory requirements. The following sections give brief summaries of these reports:

2003 LCWPC Biosolids Management Plan

As required by the Ohio EPA, the LCWPC prepared a biosolids management plan for the Indian Lake facility. The plan follows the outline given by Ohio EPA, which addresses preferred disposal methods (land application and landfill for Indian Lake); estimated quantity of biosolids; method of operation; land application monitoring; and compliance monitoring, reporting, and record keeping. From the review of the current operation, the County decided to further review the operation of the solids train of the facility to help meet current biosolids regulations.

2003 Indian Lake WPCP Solids Evaluation

As a continuation of the Biosolids Management Plan, this study identified some of the challenges of the facility's sludge train. Though the report focused mainly on the sludge train, other wet stream processes were noted that had an effect on the biosolids system. The "sugar sand" type grit that enters the collection system leads to plugging of the primary clarifiers, resulting in poor control of drawoff of sludge from the primaries. This inability to control the sludge withdrawal system leads to hydraulic and organic spikes in the anaerobic digesters. Odors from the sludge press room have become problematic. Process monitoring and sampling protocol must be addressed if operators are going to be able to determine a proper solids balance. Though the switch from anaerobic digestion to aerobic digestion was noted, it was recommended that the County initiate a Wastewater Master Plan to look at what future requirements may mandate in the way of process treatment – both in wet stream and solids handling.

2004 Indian Lake Infiltration and Inflow Study

The Master Plan work began and it became apparent that there was not a sufficient handle on flows, origins of flow, volumes of flow or rates of flow. To help in answering these concerns and in establishing a peak hourly design flow for the Indian Lake facility, an infiltration/inflow (I/I) study was performed for some of the satellite systems entering the main gravity collection system in Russells Point. Nine of the thirteen mini-systems were metered with seven of the nine producing I/I rates greater than 3,000 gallon per day (gpd)/inch-mile of sewer. From this information, it was recommended that the County begin a program at the largest I/I contributing mini-system (based on peak-to-average flow ratios – the Orchard Island Minisystem) to identify and correct problems in the system.

FUTURE REGULATORY CLIMATE

As previously mentioned, the goal of a master plan is not only to correct current situations affecting a treatment facility, but also to predict future requirements that may exist within the twenty year planning cycle. Some of the initiatives that are being monitored for future NPDES permit cycles include:

- Nutrient removal (mainly nitrogen and phosphorous).
- Total Maximum Daily Loadings (TMDLs)
- Sludge Regulations
- Disinfection Byproduct Rules (DBP)
- Blending Policy

These requirements will be discussed in greater detail in subsequent chapters of this report.

CHAPTER TWO

SUMMARY AND RECOMMENDATIONS

SUMMARY

The Indian Lake Wastewater Treatment Plant, as managed by the Logan County Water Pollution Control, is nearing the end of its twenty year design life. Along with such factors as increased maintenance and difficulty in finding replacement parts for the equipment, the current facility will not be able to meet expected future regulatory requirements. Such items as total maximum daily loadings (TMDLs), nutrient removal (nitrate and phosphorous), blending policy, and sludge management requirements will need to be addressed within the next five to ten years.

Current average daily wastewater flows entering the Indian Lake facility are approximately 1.80 million gallons per day (mgd). The current design average daily flow of the facility is 2.30 mgd. Though some growth is expected to occur over the twenty year planning period, it is not believed that the future average daily will surpass the treatment capacity of the plant. From previous studies, the expected peak hourly flow entering the facility is approximately 13.59 mgd.

Recommended improvements at the plant are based upon an average daily flow of 2.30 mgd and a peak hourly flow of 9.40 mgd, with flow equalization available during peak wet weather events. The improvements include: 1) additional influent wet well and pumping capacity, 2) new influent fine screen, 3) flow equalization, 4) anoxic biological treatment, 5) secondary treatment improvements, 6) ultraviolet disinfection, 7) aerobic sludge holding, 8) new sludge press, and 9) sludge storage. With more stringent effluent limits on the horizon, the LCWPC also investigated options to provide a tertiary treatment quality effluent. Tertiary

rapid sand filters following traditional secondary treatment (conventional aeration and secondary clarifiers) were compared to a membrane bioreactor (MBR) system. The estimated project cost for tertiary rapid sand filters following secondary treatment is approximately $13,600,000. The estimated project cost for an MBR system is approximately $16,008,000.

RECOMMENDATIONS

Floyd Browne Associates, Inc. recommends that the LCWPC:

1. Submit this report to the Ohio Environmental Protection Agency (EPA) for their review as a General Plan for plant improvements.
2. In conjunction with FBA, meet with Ohio EPA to discuss the requirements, scope and goals of the envisioned wastewater treatment plant (WWTP) improvement program.
3. Upon general agreement with Ohio EPA on the scope of this improvement plan, review and revise the proposed WWTP basic design data and adjust estimated construction and annual operation and maintenance costs as necessary.
4. Pursue funding options, as necessary, such as grants and low interest loans, as well as any other financial avenues as needed to finance the improvements.
5. Authorize the preparation of detailed plans and specifications for the proposed WWTP improvements after reaching agreement with Ohio EPA on recommended improvements.
6. Upon completion of design, submit the plans and specifications along with a Permit-To-Install (PTI) application, Antidegradation Addendum, and NPDES permit modification to Ohio EPA for their approval to proceed with construction and rehabilitation of proposed facilities.

7. Proceed with bidding and construction of the proposed facilities upon receipt of the PTI from Ohio EPA.

8. Based on recommendations in the I/I Study, continue collection system upgrades as resources allow.

CHAPTER THREE

CURRENT SITUATION

SYSTEM OVERVIEW SUMMARY

The Indian Lake facility employs a wet stream system using preliminary treatment (comminutors/bar screens and grit removal), primary clarification, conventional aeration treatment, secondary clarifiers, and chlorine disinfection. The solids stream includes pumping co-settled sludge from the primary clarifiers to anaerobic digestion, belt filter press, and ultimate disposal either at a landfill or land application locations using Class B regulations. Though this system was 'modern' in the mid-1980s, the system will continue having problems in meeting future regulatory requirements as future NPDES permits become more stringent. The basic design data for the Indian Lake facility is given in Appendix A, while the current layout and block flow diagram are given in Plates 1 and 2, respectively (for continuity purposes, plates are located at the end of the chapter in which they are referenced). Appendix B contains the most recent NPDES permit for the Indian Lake facility.

DESIGN DESCRIPTION

Preliminary Treatment

Raw wastewater from the collection system enters the head of the plant and large solids are removed by a coarse bar screen. Following screening, the wastewater then proceeds on to comminution. Two comminutors are located in the channel with an average flow capacity of 2.1 to 4.6 million gallons per day (mgd) and a peak capacity of 7.5 mgd. The comminutors and screening provide protection against clogging the influent raw wastewater pumps by shredding and separating the solids in the flow stream.

Following comminution, the anaerobic digester overflow along with the effluent from Honda Transmission combine with the raw wastewater before the wet well of the influent pumps. Four pumps, two variable speed and two constant speed, are required for the raw wastewater pumping demand. Each pump has a capacity of 2,100 gallons per minute (gpm) and 40 Hp. The combined wastewater flows are pumped to the grit tanks (13 ft W x 20 ft L x 9 ft 8 in average water depth - AWD).

Grit removal at WWTP is accomplished by using an aerated grit chamber. In the aerated grit chamber, air is introduced on one side of the chamber and the agitation creates a spiral flow pattern perpendicular to the flow through the tank. Therefore, the heavier particles will settle to the bottom while the lighter material remains suspended in the flow. Two positive displacement blowers, one online and one standby, provide the required demand for the aerated grit chamber. Each blower has a capacity of 500 standard cubic feet per minute (scfm) and 20 Hp.

The grit is removed by utilizing a screw conveyor system with a bucket elevator. The bucket elevator hauls the grit from the screw conveyor to the upper housing. From there, the washer advances the grit up the incline. The washer provides a water spray throughout to cleanse the grit and serve as a secondary stage in removal of the volatile solids from the grit. The dry grit is placed into the hopper to be transported to the designated landfill.

The preliminary treatment effluent enters the preaeration tanks (13 ft W x 20 ft L x 9 ft-8in AWD). As in the case of the grit chamber, air is introduced on one side of the chamber to maintain constant agitation. The preaeration tanks utilize the same setup that was required for the grit chamber with two blowers sized for 500 scfm and 20 Hp. The flow travels across

a weir from the preaeration tanks to the effluent channel. From the effluent channel, the flow enters the primary clarification splitter box.

Primary Treatment

The WWTP has two primary clarifiers (60 ft diameter x 12 ft side water depth - SWD) that are circular tanks with a radial flow pattern. To achieve a radial flow, the influent from the splitter box is center fed into the influent well from the underside of the clarifiers. The bottom of the clarifier is sloped such that the scraper mechanism deposits solids into the hopper. The solids are drawn off from the hopper by the sludge pumps, which are located in the control building. The scum deflector and baffle arrangement isolates the scum, which is also sent to the control building. The primary effluent travels over a v-notch weir to the effluent drop box. From the drop box, normal effluent flow (up to 4.6 mgd) is fed to the aeration splitter box. Any flow in excess of the peak flow is sent directly to the chlorine contact tanks via a secondary bypass line.

Secondary Treatment

Normal flow of the primary effluent is to the aeration splitter box there it combines with the returned activated sludge (RAS). This flow can be equally diverted to each of the three aeration tanks. At peak flow, the total air required is 2,400 standard cubic feet per minute (scfm). Therefore, a blower with a capacity of 1,250 scfm and 100 Hp was installed for each aeration train providing the system an overall firm capacity of 2,500 scfm. The air is dispersed throughout the tank using a header and fine bubble diffuser piping system.

The aeration tanks (25 ft W x 110 ft L x 15 ft SWD) are rectangular concrete tanks that are open to the atmosphere. The influent and effluent from the aeration tanks are equipped

with sluice gates to control the direction of flow. A drain for each tank is available for the purpose of dewatering.

From the aeration tanks, the flow enters the splitter box for the secondary clarifiers. The WWTP has two secondary clarifiers (55 ft x 14 ft SWD) that are circular tanks with a peripheral effluent similar to that of the primary clarifier. A scraper on the bottom of the clarifier directs the sludge to the center well via hydraulic pick-up tubes. The RAS flows to the secondary building and can be pumped to the primary clarifier as waste activated sludge (WAS) or returned to the aeration influent as RAS. The clarified effluent travels across the weir to the effluent drop box. From there, the secondary effluent is sent to the chlorine contact tanks for disinfection.

Post Treatment

The WWTP currently employs chlorine gas in the disinfection of the wastewater. Four one-ton containers of chlorine are stored on site at the chlorine building although inventories are maintained so as to not require existence of a risk management program under the Clean Air Act. Three chlorinators diffuse the gaseous chlorine into the rapid mix chamber. Two chlorinators were originally sized for a capacity of 200 pounds per day (lb/d) each, while the third was sized for 1000 lb/d. Currently, one of the small units has been downsized to 100 lb/d for controllability. The 1,000 lb/d unit has been scavenged for repair parts. There have been modifications to the control system too, and these need to be refined.

The secondary effluent and secondary bypass flows combine at the chlorine rapid mix chamber where the gaseous chlorine is diffused into the wastewater and completely mixed. The flow travels across a weir into the influent channel of the chlorine contact tanks. Two sluice gates direct the treated wastewater to either chlorine contact tank (19 ft W x 34 ft-8 in L

x 8 ft SWD). The water enters the baffled contact tank to allow for adequate detention time for disinfection to occur. The detention time in the tank for a flow of 8.3 mgd is thirteen minutes; however, an additional detention period of ten minutes occurs within the 36" diameter effluent line to the Great Miami River.

Sludge Treatment

Anaerobic digestion is a process typically used in the stabilization of primary and secondary sludge produced from municipal and industrial wastewater. Anaerobic digestion can be simply defined as the biological decomposition of organic and inorganic matter in the absence of oxygen. The WWTP currently employs a two-stage digestion by incorporating primary and secondary digesters.

The first stage of digestion occurs in the primary digester where anaerobic microbes break down organics to yield a stable sludge through continuous heat and mixing. The digested sludge is transferred to the secondary digesters. The sludge eventually settles out into layers of gas, scum, supernatant, and digested sludge. Methane gas produced by the anaerobic digestion process is vented to a waste gas burner adjacent to the digesters. The supernatant is withdrawn from the primary and secondary digesters and recycled to the head of the treatment plant. The digested sludge and scum are then transferred into a holding tank.

Progressive cavity pumps transfer the solids from the holding tank to the Maintenance Dewatering Building where a belt filter press dewaters the solids. The pressate (water removed from the sludge) is recycled to the front of the plant. Sludge cake is conveyed into a separate room of the building, where a loader is waiting to dispose of the solids by land application or landfill. The County currently disposes by landfilling.

PLANT CHALLENGES

The LCWPC operations staff at the Indian Lake facility is facing some challenges with the existing system. The following sections indicate some of the areas of largest concern.

Age of Equipment

As has been previously noted, the Indian Lake facility is approaching the twenty year design life of the plant. Thus normal wear on equipment is leading to more maintenance requirements with replacement parts for the aged equipment becoming increasingly harder to purchase.

Sludge Train

In the past, the issue of raw sludge pumping led to the largest general concern in plant operations. The Indian Lake plant is unique in the makeup of the raw wastewater entering the plant. A fine "sugar sand" grit enters the plant with the raw wastewater. This grit is too fine to settle out in the aerated grit chamber, which leads to a large amount of the sand settling in the primary clarifiers. This sandy material had the tendency to wear the impellers of the centrifugal pumps and led to a raw sludge that became cement-like in nature, thus tending to plug the primary withdrawal lines. The nature of the sludge, coupled with the relatively long length of the withdrawal pipe, led to a labor-intensive sludge withdrawal process. The labor intensity concern was further exasperated by the fact that the withdrawal process was totally manual. As the plant was not staffed on evenings or weekends, sludge tended to collect in the primary clarifiers and then the rest of the week was spent trying to get the process under control.

Without proper control over the withdrawal process, the anaerobic digesters experienced repeated inconsistent loadings. This was significant because: 1) hydraulically, the

digesters would generate an increase in recycle flow and load to the front end of the plant and 2) organically, an inconsistent volatile solids reduction was achieved. The replacement of the old centrifugal pumps with new positive displacement pumps in 2004 appears to have solved most of these concerns.

Monitoring

In order to determine the effectiveness of the system currently, a solids balance across the sludge train was attempted during the 2003 Sludge Evaluation Report. This balance used information from the 2002 monthly operating reports only, as the 2001 data were not as complete. As noted in the previous report, the LCWPC does not have a good handle on the actual loadings in the solids train of the Indian Lake plant. From this information, the Indian Lake plant could be years in arrears with the solids balance. To effectively manage the solids created at the plant, the LCWPC must get control of the process monitoring.

The inability to accurately represent conditions in the plant makes it almost impossible to reliably report compliance with the sewage sludge regulations (40 CFR Part 503 and the Ohio Sewage Sludge Rules). Specifically, anaerobically digested sludge must exhibit a 38% volatile reduction, which was not achieved in February, May, June, and July of 2002. At least the numbers with which the staff had to work did not compute to 38% volatile reduction. This is a two pronged problem: 1) the staff is forced to report non-compliance and 2) they do not really know the conditions under which they must perform. The situation ends up being that they may or may not be reporting compliance on conditions that may or may not, in fact, be compliant – a multi-edged sword.

To help with the solids balance, a more frequent and more representative sampling protocol needs to be followed. This could include more frequent grab samples or purchasing

automatic samplers on lines that are regularly reported to Ohio EPA or on any line that is critical to the solids balance. Another requirement will be improved metering. This could include adding, calibrating, and/or relocating meters.

Others

- Another concern is the release of hydrogen sulfide and ammonia gas within the building housing the sludge press. The gas not only produces objectionable odors, but also can lead to corrosion of other equipment in the room. The major concern of the gas lies in the effect of the relatively high concentration of gas on the operators. However, there have been a few objections noted from the public, especially when the doors are left open to help alleviate odors in the press room. The room was constructed with air exchange equipment, but did not have an odor control system with the unit; therefore, the fumes are discharged to the atmosphere without treatment. When gas levels are high, it is a concern to vent the gases, as neighbor complaints of odor could occur.
- The existing sludge beds are sand drying beds typical of construction practices of the mid-1900s. The sludge beds currently have no means for allowing a tractor to enter the bays; thus, all cleaning of the beds would be accomplished by manually shoveling the biosolids. The beds would need to be fitted with concrete driving pads to allow a tractor to drive across the beds or replaced with a plastic media to allow ease of maintenance on the beds.
- Should the County decide to begin a land application program using outside farm fields for biosolids disposal, the importance of being able to quickly

distribute the biosolids will be noted. Typically, there are only two times that farmers will allow a municipality to apply biosolids: 1) between the time following the spring thaw and the time they plant their fields and 2) following the fall harvest and the period before the winter freeze begins. This may present the County only a two week window for applying the biosolids in a six month period. To help with attaining this goal of using outside farm fields, it may be advisable to purchase a new spreader capable of quickly distributing the biosolids.

HYDRAULIC CONSIDERATIONS

The current facilities are designed to treat an average daily influent flow of 2.3 million gallons per day (mgd) and a peak hourly flow through secondary treatment of 4.6 mgd. A secondary treatment bypass was installed to allow an additional 3.7 mgd of stormwater (a total peak flow of 8.3 mgd) to flow on to the chlorine contact chamber for disinfection. Though the plant capacity is sufficient for normal diurnal peaks and small storm events, longer and more intense storm events can lead to surcharging of the system.

As previously noted, in 2004 FBA aided the County in conducting a metering program to determine the biggest minisystem contributors to the infiltration/inflow (I/I) entering the system. The following were recommendations that were contained in the report:

- The minisystems around the southern portion of Indian Lake are the most influenced by rain induced I/I. These are Captains Point, Roadside Rest and Midway. Continued investigation into and removal of the excessive I/I should be pursued.

- Surcharging that occurred in these minisystems (North St., Captains Point and Roadside Rest) is due either to flows being greater than the pumping capacity at the WPCP or to the lack of capacity in the sewer trunk system (or possibly both). This should be determined before any plans to expand the WPCP are implemented.
- In comparing the differences between the April 22, April 30 and May 1 rain events in terms of the total volumes of I/I, it is apparent that the major difference noted is due to the level of groundwater or saturation before the May 1 rain event. Several of the minisystems showed delayed increases in flow in relation to the start of the rain, indicating that the groundwater around the sewers was low. The April 22 and April 30 rains seemed to have increased the groundwater enough to make the May 1 rain event much more pronounced.
- In terms of minisystems that have long recovery periods, North St., State Campground and Roadside minisystems were the longest based on the May 1 rain event. This indicates that a large amount of the total I/I is from rain-induced high groundwater as opposed to direct inflow. Infiltration sources come from public sewer defects as well as private laterals. Smoke testing will help identify the sources of the infiltration.
- The minisystems that are most affected by rain-induced inflow are Captains Point, Midway and North St. This is evidenced by looking at the hydrographs and noting the sharp increases in flow after the rain starts and the sharp decreases after the rain stops. This is indicative of inflow sources such as downspouts, footer drains, sump pumps and leaking manholes. Several other

minisystems are similarly affected, including Roadside Rest, Seminole and Minnewauken.

Following this review, it can be determined that the Indian Lake Facility is receiving peak storm events that are beyond the capacity of the combined collection and treatment systems. Therefore, it will be important the LCWPC to perform one of two tasks: remove sufficient I/I from the collection system or address the peak flow capabilities of the treatment plant itself (increased capacity and/or flow equalization).

Peaking Ratios

As can be noted from Table No. 1, the average daily flow (ADF) from the Indian Lake facility from January 2001 to March 2003 was 1.80 mgd. Peak flows have reached 7.75 mgd in the same timeframe with peaking ratios (defined in this context as minimum daily flow to maximum daily flow) of 6.43:1. As noted in the previously mentioned 2004 Infiltration and Inflow Study, the current influent pumps into the facility are hydraulically overloaded and cause the collection to surcharge. Therefore, accurate peak flow metering cannot be achieved. However, from the Infiltration and Inflow Study, peak hourly flows have been estimated at 13.6 mgd.

LOADINGS

In order to determine the correct design criteria for the current plant, influent five day carbonaceous biological oxygen demand (CBOD) and total suspended solids (TSS) loadings are given in Tables No. 2 and 3, respectively. From Table No. 2 it can be noted that the average influent CBOD concentration is 46.0 mg/L and the maximum is 122 mg/L. Also, the average CBOD loading is 568 pounds per day (lb/d) and the peak is 1,762 lb/d. From Table No. 3, it

can be noted that the average influent TSS concentration is 96.4 mg/L and the maximum is 1,180 mg/L. Also, the average TSS loading is 1,292 lb/d and the peak is 13,148 lb/d.

The ammonia-nitrogen (NH_3) loading from the primary clarifier effluent is given in Table No. 4. From this table, it can be noted that the average NH_3 concentration exiting the primary clarifiers is 15.8 mg/L with a peak daily concentration of 35.0 mg/L. Also, the average NH_3 loading is 200 lb/d and the peak is 496 lb/d.

TABLE NO. 1
DAILY FLOWS AT THE INDIAN LAKE WPCF

Date	Avg Flow (mgd)	Max Daily Flow (mgd)	Min Daily Flow (mgd)	Max/Min Ratio
January 2001	1.41	3.20	1.11	2.88
February 2001	1.97	4.33	1.36	3.18
March 2001	1.52	3.32	1.20	2.77
April 2001	2.35	5.80	1.25	4.64
May 2001	2.89	7.27	1.13	6.43
June 2001	1.54	2.05	1.15	1.78
July 2001	1.39	2.11	1.13	1.87
August 2001	1.50	2.45	1.04	2.36
September 2001	1.50	2.66	1.01	2.63
October 2001	2.19	4.68	1.01	4.63
November 2001	1.44	4.28	0.91	4.70
December 2001	2.11	5.99	1.19	5.03
January 2002	1.53	5.57	1.00	5.57
February 2002	2.05	7.50	1.29	5.81
March 2002	2.32	5.03	1.40	3.59
April 2002	3.09	6.09	1.50	4.06
May 2002	2.51	7.75	1.46	5.31
June 2002	1.38	2.18	1.17	1.86
July 2002	1.14	1.62	0.74	2.19
August 2002	1.12	1.72	0.90	1.91
September 2002	0.99	3.30	0.77	4.28
October 2002	0.90	1.61	0.68	2.37
November 2002	1.26	2.57	0.88	2.92
December 2002	1.63	5.70	0.96	5.94
January 2003	1.74	5.53	1.08	5.12
February 2003	1.81	4.31	1.04	4.14
March 2003	3.37	7.14	1.70	4.20
DAILY AVG FLOW = 1.80 mgd				

TABLE NO. 2
INFLUENT CBOD CONCENTRATIONS AND LOADINGS

Date	Flow (MGD)	CBOD Concentration (mg/L)			CBOD Loading (lb/day)		
		Low	Avg	High	Low	Avg	High
Jan 2001	1.34	24.5	47.9	63	257	535	782
Feb 2001	2.05	17.5	34.5	72	368	590	1271
Mar 2001	1.56	32	44.4	64	418	578	708
Apr 2001	2.56	**4.5**	20.4	46.5	**63**	436	950
May 2001	3.04	8	25.7	37.5	214	652	914
June 2001	1.52	26	45.3	60	264	574	683
July 2001	1.37	34	59.2	84	417	676	1392
Aug 2001	1.49	25	51.4	80.5	251	639	1185
Sep 2001	1.54	22.5	39.1	71.5	257	502	638
Oct 2001	2.36	7.5	27.0	49	279	531	669
Nov 2001	1.24	20	54.4	88	223	562	1310
Dec 2001	2.23	11	31.4	47.5	247	584	562
Jan 2002	1.38	6.5	41.0	72.5	226	472	766
Feb 2002	1.76	9	14.8	45	131	217	565
Mar 2002	2.13	23	34.9	52.5	419	620	1366
Apr 2002	**3.12**	5.5	8.7	17.5	96	226	643
May 2002	2.53	5.5	17.3	32	129	365	790
Jun 2002	1.37	22	55.6	110	332	635	1296
Jul 2002	1.13	29	64.7	92	178	610	1063
Aug 2002	1.12	14.5	60.0	86	152	560	767
Sep 2002	0.95	35.5	74.6	108	284	591	792
Oct 2002	0.87	68	**100.4**	**122**	571	728	918
Nov 2002	1.31	53.5	80.7	118	510	**882**	1734
Dec 2002	1.49	14.5	69.5	106	528	864	**1762**
AVERAGE	**1.80**		**46.0**			**568**	

TABLE NO. 3

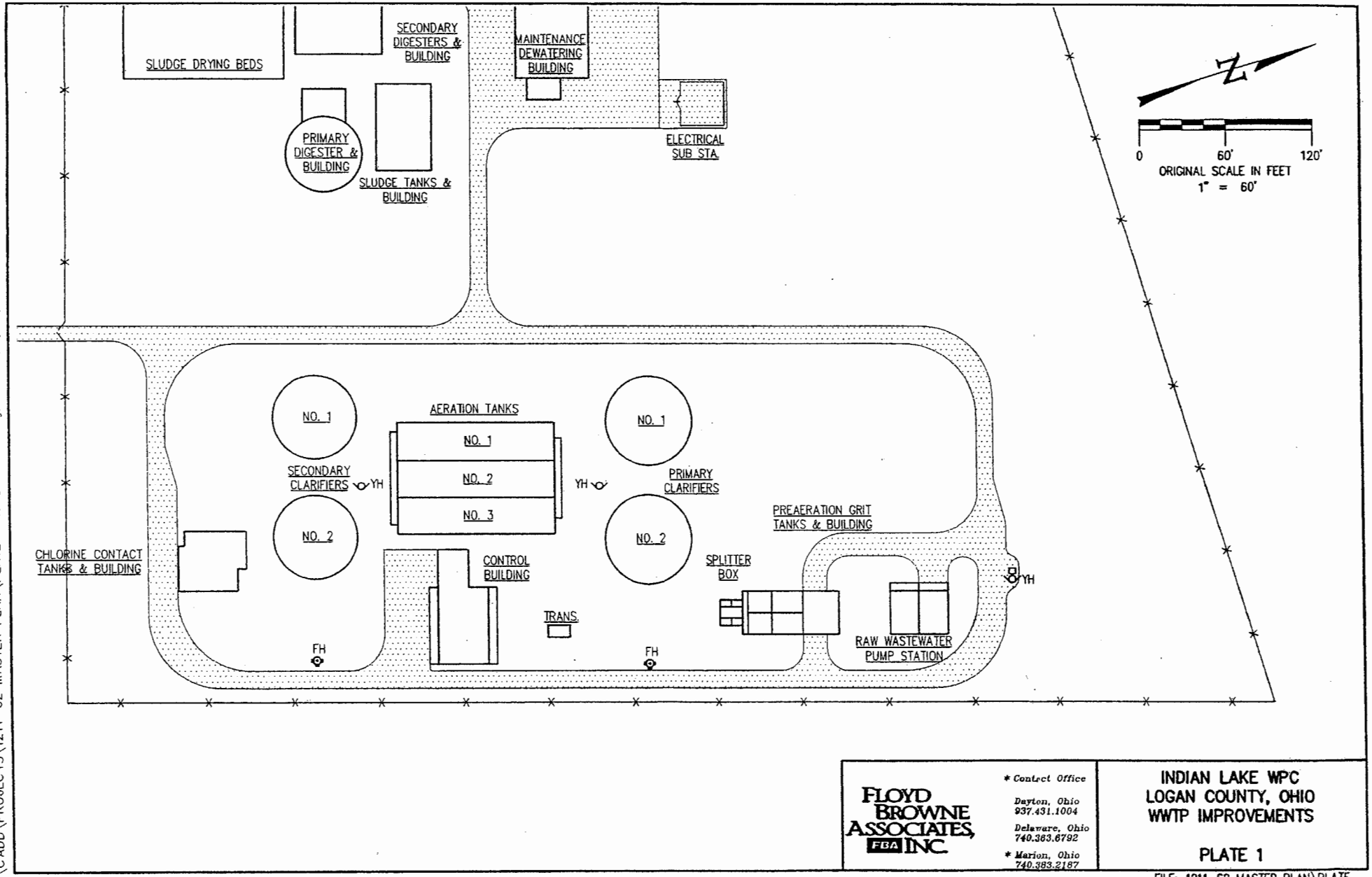
INFLUENT TOTAL SUSPENDED SOLIDS CONCENTRATIONS AND LOADINGS

Date	Flow (MGD)	TSS Concentration (mg/L)			TSS Loading (lb/day)		
		Low	Avg	High	Low	Avg	High
Jan 2001	1.34	20	72.4	124	198	809	1,870
Feb 2001	2.05	34	59.0	80	490	1,008	1,412
Mar 2001	1.56	52	76.8	112	552	999	1,583
Apr 2001	2.56	20	66.3	118	295	1,415	3,472
May 2001	3.04	14	92.9	178	335	2,355	6,519
June 2001	1.52	40	92.5	168	501	1,172	1,708
July 2001	1.37	26	125.6	236	295	1,435	2,501
Aug 2001	1.49	40	96.9	178	634	1,204	2,481
Sep 2001	1.54	52	109.7	168	752	1,408	2,546
Oct 2001	2.36	24	75.9	132	289	1,493	4,322
Nov 2001	1.24	**5.2**	83.2	208	263	860	2,319
Dec 2001	2.23	12	62.6	118	406	1,164	1,395
Jan 2002	1.38	16	80.9	174	156	931	3,068
Feb 2002	1.76	16	64.4	112	286	945	1,848
Mar 2002	2.13	26	80.0	272	470	1,421	5,249
Apr 2002	**3.12**	34	62.1	100	642	1,616	3,813
May 2002	2.53	38	85.9	198	685	1,812	5,745
Jun 2002	1.37	14	80.9	218	**137**	924	2,569
Jul 2002	1.13	20	**254.1**	**1180**	188	**2,394**	**13,148**
Aug 2002	1.12	34	127.5	242	358	1,190	1,956
Sep 2002	0.95	38	108.0	190	259	856	1,604
Oct 2002	0.87	62	127.8	188	353	927	2,144
Nov 2002	1.31	50	112.4	156	525	1,228	3,305
Dec 2002	1.49	34	115.6	156	394	1,436	5,267
AVERAGE	**1.80**		**96.4**			**1,292**	

TABLE NO. 4

AMMONIA CONCENTRATIONS AND LOADINGS (from primary clarifier effluent)

Date	Flow (MGD)	NH_3-N Concentration (mg/L)			NH_3-N Loading (lb/day)		
		Low	Avg	High	Low	Avg	High
Jan 2001	1.34	8.4	13.3	20.0	123	149	224
Feb 2001	2.05	8.6	11.2	15.0	131	191	234
Mar 2001	1.56	12	17.5	24.0	165	228	257
Apr 2001	2.56	7.4	11.2	19.0	121	239	255
May 2001	3.04	4.8	11.1	17.0	125	**281**	**496**
June 2001	1.52	16	18.5	21.0	197	234	277
July 2001	1.37	8	17.2	22.0	141	196	270
Aug 2001	1.49	14	19.5	23.0	145	242	225
Sep 2001	1.54	8.7	14.9	24.0	111	191	223
Oct 2001	2.36	1.7	7.3	18.0	59	144	154
Nov 2001	1.24	16	17.5	20.0	143	181	188
Dec 2001	2.23	2.1	9.8	15.0	102	182	152
Jan 2002	1.38	10	14.4	21.0	97	166	226
Feb 2002	1.76	6.1	8.1	10.0	101	119	134
Mar 2002	2.13	6.2	8.5	9.8	97	151	248
Apr 2002	**3.12**	**1.0**	5.9	9.6	**36**	154	210
May 2002	2.53	4.2	8.2	12.0	108	173	161
Jun 2002	1.37	22	24.2	26.0	245	276	270
Jul 2002	1.13	26	29.0	32.0	172	273	282
Aug 2002	1.12	21	22.3	24.0	170	208	225
Sep 2002	0.95	19	26.8	**35.0**	130	212	223
Oct 2002	0.87	19	**27.0**	34.0	156	196	255
Nov 2002	1.31	17	18.8	21.0	150	205	194
Dec 2002	1.49	11	17.0	22.0	108	211	194
AVERAGE	**1.80**		**15.8**			**200**	



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INDIAN LAKE WPC
LOGAN COUNTY, OHIO
WWTP IMPROVEMENTS

PLATE 1

FILE: 1211-62 MASTER PLAN\PLATE

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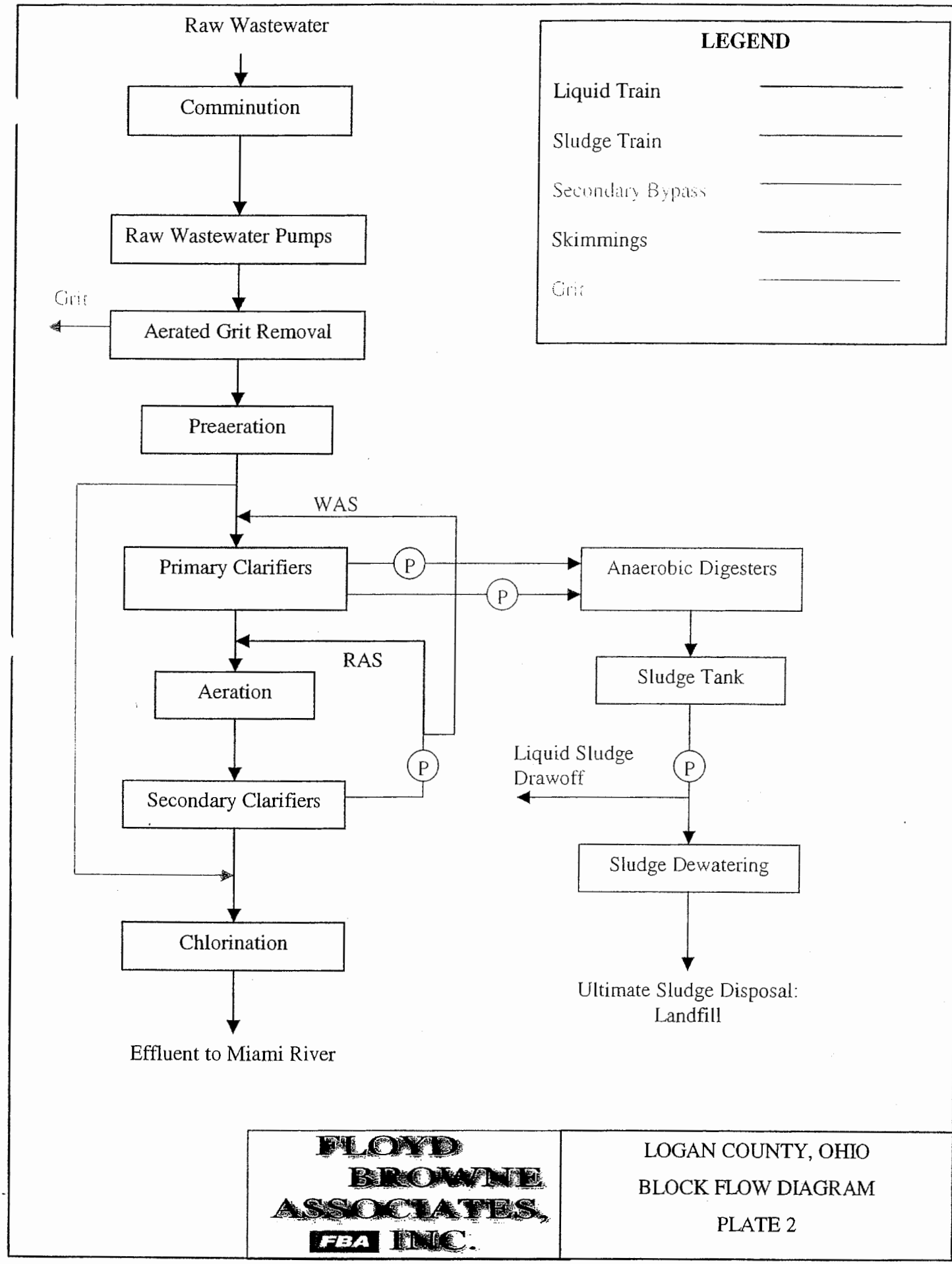


FLOYD BROWNE ASSOCIATES, INC.

LOGAN COUNTY, OHIO
BLOCK FLOW DIAGRAM
PLATE 2

CHAPTER FOUR

FUTURE CONSIDERATIONS

As previously stated, this report is a plan to carry the Logan County Water Pollution Control into the next twenty years. Therefore, the thought process must not be limited to the "snapshot" of the regulatory requirements currently in place, but planning what the future criteria may contain. This section deals with some issues that may occur within the design life of any upgrades to the Indian Lake facilities.

GROWTH

The service area around Indian Lake has historically been a resort community with seasonal variations in population. The table below lists the County Census information, as well as information on some of the larger communities within the service area:

TABLE NO. 5
CENSUS INFORMATION FOR THE PLANNING AREA

Location	1970	1980	1990	2000
Logan County	35,072	39,155	42,310	46,005
Richland Township	1,872	2,015	2,189	2,545
Stokes Township	3,337	4,157	5,097	5,254
Washington Township	2,626	2,776	3,409	4,129
Russells Point	1,104	1,156	1,504	1,625
Lakeview	1,026	1,089	1,056	1,082
Belle Center	985	930	827	818

As can be noted, Logan County has steadily shown growth of between eight and twelve percent per decade. Each of the major Townships has also seen significant growth trends since the 1970s. This growth can also be seen in the Village of Russells Point, which has grown between five and thirty percent per decade. The Village of Lakeview has kept a fairly constant population, while the Village of Belle Center has been losing population since the 1970s.

From these growth trends, the future hydraulic and organic loading reaching the Indian Lake facility must be evaluated. Current issues with infiltration/inflow may be artificially reducing the influent contaminant concentrations; therefore, loading will be used to determine the extent of growth within the Indian Lake Facilities service area.

As previously stated, Logan County has steadily been growing since the 1970s by eight to ten percent per decade. The affected Townships have grown at similar rates (Richland from 8-16%, Stokes from 3-25%, and Washington from 6-23%). Though not all of the growth in the Townships reflects the growth within the service boundary, it is important to account for a level of growth on the fringes of the current boundary.

NUTRIENT REMOVAL

The current NPDES permit for the facility addresses "standard" effluent criteria, such as five-day carbonaceous biological oxygen demand ($CBOD_5$), total suspended solids (TSS) and ammonia-nitrogen (NH_3-N). However, several locations within the state have been receiving limits on nitrates, total nitrogen and phosphorous. Nitrates are currently controlled in locations that discharge into a drinking water source, while phosphorous limits are included for all plants that have a receiving stream in the Lake Erie drainage basin, although the phosphorus limitations are no longer confined to the Lake Erie watershed. Both nitrogen and phosphorous are removed from wastewater during cell assimilation, but the carbon-to-nitrogen-to-phosphorous ratio for cell synthesis is 100:5:1, and this does not sufficiently remove the nitrogen and phosphorous present in wastewater.

Nitrogen in wastewater is typically in the form of an ammonium compound (measured as NH_3-N). The NH_3-N is oxidized naturally by bacteria in aeration basins to a nitrateform. The resultant nitrate has been linked with methemogobinemia, a disease harmful to infants, and

to increased incidents of stomach and esophageal cancer. Therefore, its removal, though not mandated currently, could well be required in future NPDES permits.

Phosphorous in wastewater, though not lethal to humans or wildlife, can affect the biological health of receiving bodies of water. As previously mentioned, phosphorous is needed by cells for growth. In most bodies of water, the limiting nutrient in cell growth is phosphorous. For this reason the United States banned the use of common household laundry detergents containing phosphorous compounds. When algae increases in water due to high phosphorous levels to the point that more oxygen is required than is available, the waterway is said to be in eutrophication. In common terms, it is a dying waterbody.

TOTAL MAXIMUM DAILY LOADINGS (TMDLs)

Currently, the United States Environmental Protection Agency (USEPA) is in the process of coordinating TMDLs for all of the major waterbodies within the country. The TMDL is a calculation of the maximum amount of a pollutant, identified by USEPA, that a waterbody can receive and still meet water quality standards. Waterbodies are broken into several classes, including drinking water supply, contact recreation (swimming), and aquatic life support (fishing). A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The calculation includes a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation also accounts for seasonal variation in water quality.

The significance of TMDLs on treatment plants within Ohio is that new, more stringent limits can be expected; especially in those areas that discharge to high quality waters. The old method of setting of effluent criteria was based upon the Best Available Demonstrated Control

Technology (BADCT), which set concentration limits regardless of expected flows. TMDLs look at loadings, which sets the concentration based upon the flow of the treatment plant:

Flow x Concentration = Loading

Not only will tighter discharge limits for "standard" pollutants be realized, but the addition of nitrate and phosphorous limits could also be noted.

Sampling for the TMDL for the Great Miami River will begin in 2008 and the TMDL will be completed in 2010. The current NPDES permit runs through 2006, which means that the County can expect new effluent limits on the following permit renewal (approximate date of 2011).

SLUDGE REGULATIONS

Currently, there are three classifications of ultimate sludge disposal that are accepted by Ohio EPA:

- Landfilling
- Class B Land Application
- Class A Land Application

Each of these sludge classifications is governed by different criteria. The use of landfill for final disposal is the most open of these options. Each landfill may have different regulations based upon the amount of biosolids applied and the moisture content of the sludge.

For land application, the classification is based upon two conditions: vector attraction and pathogen density. Class B Land Application, while less costly to construct and operate, is closely monitored by Ohio EPA. Ohio EPA must approve application areas based upon soil conditions, slope, and proximity to habitable lands. The County must manage the

transportation of sludge, create a spill contingency plan, track and record land application cycles, ensure that locations are not overloaded in nutrients and heavy metals, and sample the applicable biosolids and soils. With the stringent requirements of the Class B program already in place and more requirements expected, the future of Class B sludge is uncertain. Already many newer plants are researching Class A Land Application and landfilling as options.

Class A Land Application, while more expensive to construct and operate, does not have the high level of monitoring required with Class B. Handling of Class A sludge is similar to the handling of commercial fertilizer. Once the method of attaining Class A sludge is approved by Ohio EPA, the finished product can be used in areas of public contract, such as flower gardens, parks, or home fertilizer.

USEPA BLENDING POLICY

Blending has long been used in treatment plants to ensure that the maximum amount of peak wastewater flows reach the plant and do not spill over from the collection system as combined sewer overflows (CSOs) or sanitary sewer overflows (SSOs). Regulatory agencies have previously regarded this practice as a measure to reduce the total contaminants reaching the receiving streams during storm flow. The thought is that storm flows produce high flow/low contaminant levels that can be bypassed around secondary treatment and, when combined with secondary treatment effluent, meet the NPDES contaminant concentration limits. This is as opposed to forcing the biological treatment process to experience hydraulic washout and subsequently losing the ability to effectively treat wastewater. Though accepted with many of the regulatory agencies, this issue has never had legislation to approve or disapprove of the practice. The United States Environmental Protection Agency (USEPA) has begun a policy for blending with six principles that must be followed to comply with findings:

1. Final effluent meets all NPDES permit discharge requirements, based on secondary treatment regulations and water quality requirements.
2. NPDES permit application and permit describe wet weather treatment scenarios, which are consistent with "generally accepted practices and long-term design criteria."
3. All flow receives, at a minimum, the "equivalent of primary clarification".
4. Peak flow treatment scenario is operated and designed and permitted, and is used only when flows exceed capacity of storage/equalization units, as well as biological and other advanced treatment units, based on "generally accepted practices and long-term design criteria."
5. Monitoring to ensure that there is compliance with applicable water quality based effluent limitations, and to provide data to support development of water quality-based
6. The permit must require that the collection system, over which the permittee has control, be properly operated and maintained.

Strong opposition by advocacy groups, who view the policy as a "rollback", has led to the policy implementation being delayed. With no clear answer on whether the policy will be adopted (or if the rulemaking is necessary, either to allow the practice or to make the criteria enforceable), the fate of blending as a treatment technique is still very much in question.

This factor weighs heavily on the future design criteria for the Indian Lake facility. As given in the current basic design data (Appendix 1), the current plant has peak flow capability through primary treatment of 8.3 mgd with a maximum flow through secondary of 4.6 mgd.

Thus, a flow of 3.7 mgd can be bypassed directly to the chlorine contact basin during storm events. The future use of this bypass is in question.

CHAPTER FIVE

ALTERNATIVES

This chapter investigates options that can be employed at the Indian Lake Facility to meet future regulatory requirements and to improve operations at the current plant. It will be from this list of alternatives that the proposed improvements will be based.

PRELIMINARY TREATMENT

Screens

Generally, the first unit operation at a wastewater treatment plant is the screen. Properly functioning screening is important as it assures that no items that could damage or impair other unit processes are able to enter the WWTP. The current facility employs comminution, which grinds large material to smaller parts allowing the items to pass the influent pumps. As this material is not removed from the liquid train, it can be passed onto other unit processes where it can interfere with proper treatment.

These current comminutors are approaching the end of their design life of twenty years. As the comminutors approach this milestone, increased maintenance will be noted, along with increased time to receive replacement parts as the system becomes antiquated. As a replacement to the current comminutors, it is recommended that the County invest in a screening apparatus to remove non-biodegradable materials from the waste stream.

Screens are generally classified by the size of the open space and by the cleaning mechanism. The Recommended Standards for Wastewater Facilities, 2004 Edition (or Ten States Standards) as compiled by the Great Lakes – Upper Mississippi River (GLUMR) Board of State and Provincial Public Health and Environmental Managers, recognizes the classification of "fine screens" as an opening size of 1/16" or smaller with other screens

classified as standard size. The cleaning options are mechanical and manual, with several subsections of each.

The major discussion point for the County is where in the treatment scheme to place the future screen. Currently, the comminutors are located prior to pumping. The new screen could be located in the existing influent chamber with the channels being modified to accept the screens. A typical bar screen could be used with a mechanical rake used for cleaning. As this area is currently prone to flooding, any electrical items will need to be placed above the current floor. Thus, the cleaning mechanism for the screen should be located out of the possible surcharging level. For the discharge of the screen, a concrete floor could be poured at the top of the existing structure and a washer/compactor could be placed. A building would be required to prevent the discharges from freezing. The estimated cost for this option would be $590,000.

The other option is to place the screens following the influent pumps. With this option, the County may want to replace the comminutors with newer models, in order to provide the influent pumps protection from large objects. These screens could be located in channel, with a much lower profile discharge. For this option, a basket screen would be recommended. As flow enters the basket, water flows through the clear spaces and screenings are retained. Once the cleaning cycle begins (either by time or by water level), the brushes on the screen rake the material into an auger, which transports the screenings up the barrel to the discharge. The discharge has a section that washes the material and presses the extraneous water from the screenings, thus removing the need for a separate washer/compactor. The new structure could be constructed in a new building located between the pump station and grit building or the channels could be constructed above the grit tanks. An effluent weir system would be

constructed to transport the design peak flow through secondary with the remainder going to the equalization basin. The estimated cost for this option would be $620,000.

Flow Equalization

As previously discussed, the LCWPC has been having problems with surcharging of the collection system during storm conditions. From the 2004 "Indian Lake Infiltration and Inflow Study", the predicted peak flow entering the treatment plant during design storm conditions is 13.59 mgd. The plant is currently designed with a peak flow capacity of 8.4 mgd. Thus, during the peak condition, the collection system receives 5.19 mgd or about 3,600 gpm more flow than the plant can handle. However, as the name suggests, this is a peak flow that will not be sustainable over the entire storm event (from the 2004 I/I Study, a 24-hour event).

Several models exist for analyzing storm flow and rainfall data. Using the Soil Conservation Service (SCS) Type II Storm, the hydrograph appears to be a "bell curve" with the vast majority of the storm occurring over a two to three hour period. But, as the Indian Lake study area encompasses several subsystems that are located relatively far from the treatment plant, the effect of storm events can be realized for longer periods than typical wastewater systems. As the typical peak flow may occur for a three hour period, it will be assumed that the peak flow at the Indian Lake facility will be received for double this period or six hours. Therefore, the total storage volume required for the equalization basin will be approximately 1.3 million gallons (MG). In order to allow a certain amount of safety factor into the procedure, the recommended basin sizing will be 1.5 MG. The estimated cost for a new equalization basin would be approximately $1,200,000 based upon the flow analysis provided – changes in peak flow would alter this number.

Influent Pumps

The existing raw wastewater pumps have recently been replaced with newer models of a Scottish manufacturer. Also, the County is in the process of replacing seven of the valves integral to the pump operation. As the design peak flow through the plant is not expected to increase, these pumps should be sufficient to provide service over the planning period.

Changes will need to be made, however, in order to allow pumping to the new equalization basin. This can be accomplished by installing new, larger pumps. The pumping system will need to be capable of transporting the design peak flow to the secondary/balancing flow splitter structure. The goal would be to flow by gravity to the equalization basin, and, once the storm has passed, pump the wastewater back to the wet stream. The estimated cost for additional pump capacity would be approximately $320,000.

Grit Removal/Preaeration

The grit chamber and preaeration tanks are currently sized for the future peak flow through the plant. Grit removal techniques may need to be addressed in order for the classifiers to be used during winter months. This would include winterizing the discharge of the classifiers by constructing a heated enclosure over the piping. Air piping and diffusers in both the grit chamber and preaeration tanks should be replaced, as the current system is not functioning properly. Also, the air supply to the grit chamber requires a means of control for enhanced operation. The estimated cost for improvements to the grit chamber and the preaeration tank would be approximately $220,000. However, as the current grit system is not capturing a large amount of grit, the more prudent method of dealing with the existing grit tanks is to demolish the classifiers and grit removal equipment and use tanks for other

processes (such as septage holding). The cost for demolishing the grit equipment is about $35,000.

PRIMARY TREATMENT

As with the grit chamber and preaeration tank, the primary clarifiers are designed to meet the future peak flow through the plant. However, depending on the sludge treatment technique that the County accepts, the future use of these tanks is in question.

Currently, co-settled raw sludge and waste activated sludge (WAS) are taken from the primary clarifiers and sent to anaerobic digestion. If the County decides to continue the use of anaerobic digestion, this current system of wasting would continue to be employed. The manufacturer of the autothermal thermophilic aerobic digestion (ATAD) equipment also noted that the use of primary clarification could improve the operations of the ATAD system by increasing the volatiles entering the digestion tank. However, ATAD would still be possible without the use of primary clarifiers. As the current primary clarifier mechanical equipment is approaching the end of its design life, new clarification equipment should be installed. The estimated cost for demolishing the current clarification equipment and installing new would be approximately $412,000.

With the use of conventional aerobic digestion or ATAD, the possibility exists of demolishing the existing clarification equipment and using the tanks for another purpose. One option would be to use the existing tanks as flow equalization tanks. From the information given in Chapter Three of this report, the primary clarifiers have a combined volume of about 508,000 gallons. Therefore, the new equalization basin volume can be reduced to about 1.0 MG. However, there would be significant changes to the piping and elevation coordination

between the clarifiers and new equalization basin. The estimated cost for converting the clarifiers into additional flow equalization volume is approximately $560,000.

Another option would be to use the tanks as additional secondary treatment for biological nutrient removal (BNR). This option would include demolishing the current clarifier equipment and installing walls to segregate the structure into different zones – aerobic, anoxic, and possibly anaerobic. The anaerobic zone would most likely not be constructed with the ATAD system, as the ATAD process releases relatively large amounts of phosphorous, which surpass the assimilative capacity of the anaerobic bacteria. The estimated cost for demolishing the current clarification equipment and installing equipment to segregate the tanks would be approximately $460,000.

SECONDARY TREATMENT

Secondary treatment refers to the biological removal of organic material by assimilation of the matter into cells and the subsequent removal of these "biosolids" through clarification. Currently, the Indian Lake facility employs a conventional aeration system with secondary clarifiers and waste activated sludge (WAS) sent to the primary clarifiers for final wasting. This section will investigate advanced nutrient removal along with investigating current capacity compared to future needs.

Biological Treatment

As previously discussed, the Indian Lake facility employs conventional aeration to nitrify and remove organic material. Currently, the existing tanks are sized to handle the future average daily flow (which is the same as the current design average daily flow). However, the existing aeration system should be replaced, as the current ceramic diffusers plug during power failures common to the area and the aeration piping has been breaking.

Therefore, a new piping system with membrane diffusers will be recommended for the current tanks. The estimated cost for demolishing the current aeration system and installing new equipment would be approximately $250,000.

With future regulations such as total maximum daily loadings (TMDLs), nitrate removal, and phosphorous removal; additional treatment may be required to satisfy effluent criteria. Adding an anoxic stage prior to aeration and providing a recycle stream from the aeration tank to the anoxic zone can accomplish nitrate removal. This recycle should be capable of transporting one to four times the design average daily flow or approximately 2.3-9.2 mgd.

The anoxic zone can be created by constructing a separate anoxic tank with mixers installed to ensure solids do not settle in the tanks. To ensure sufficient capacity to reduce the nitrate concentration below 10.0 mg/L, the hydraulic residence time (HRT) will need to be between one and two hours at design average daily flow or approximately 200,000 gallons. For purposes of this report, it will be assumed that the anoxic zone will be contained in two 100,000 gallon tanks. The estimated cost for constructing the new anoxic tanks would be approximately $300,000. The alternative is using the primary clarifiers as previously discussed.

For phosphorous removal, the two options available are chemical addition or biological removal using anaerobic zones. The chemical addition equipment would be required to meet effluent phosphorous levels (currently 1.0 mg/L in the Lake Erie drainage basin) regardless of whether biological removal is employed. The chemical addition usage would be significantly less if the biological removal process were employed.

The chemical addition will need to be located in a heated structure, which could be tied into the design of the screening option previously discussed. Typically, the coagulant chemicals employed in phosphorous removal are lime, aluminum sulfate (alum) or ferric chloride. Removal is enhanced by using a polymer as a flocculating agent. The chosen chemical will be dependent upon cost, effectiveness and Owner preferences. The chemical would be added in the clarifier splitter box to ensure proper mixing. By adding chemical, the weight of the waste activated sludge may increase by 35 to 45%, which must be considered when sizing the solids train equipment. The estimated cost for installing the chemical feed equipment into an existing building would be approximately $85,000.

The biological phosphorous removal options would be similar to the denitrification options – co nstructing new tanks or using the other half of the existing primary clarifiers. Similar to the anoxic zone, the anaerobic zone would have an HRT of between one and two hours at design average daily flow or approximately 200,000 gallons. For purposes of this report, it will be assumed that the anaerobic zone will be contained in two 100,000 gallon covered tanks. The estimated cost for constructing the new anaerobic tanks would be approximately $385,000.

The other biological option of creating an anaerobic zone in the existing clarifiers would also be similar to the anoxic zone, with the exception that the anaerobic zone would need to be covered, which indicates that the dividing walls be cast-in-place concrete. The estimated cost for constructing the anoxic zone within the existing primary clarifiers would be approximately $580,000.

Secondary Clarifiers

As previously discussed, the current secondary clarifiers are sized to handle a peak hourly flow of 4.6 mgd with an additional 3.7 mgd capable of being bypassed from primary clarification directly to the chlorine contact chamber. With the uncertainty of blending as a treatment option (see Chapter Four – Future Considerations), it would be prudent to consider adding two additional secondary clarifiers in order to make the peak flow through secondary treatment be 9.2 mgd and remove the bypass from operation (this new peak flow through secondary decreases the sizing required for flow equalization that was previously noted in this report). By incorporating a higher peak flow through secondary treatment, significant piping changes can be expected and a new splitter box would need to be constructed. The estimated cost for constructing new secondary clarifiers and splitter box and corresponding piping changes would be approximately $1,400,000.

Also, the existing secondary clarifier equipment would need to be replaced with new equipment. The estimated cost for replacing the current clarifier equipment would be approximately $370,000.

Membranes

Membrane bioreactor (MBR) technology is a relatively recent wastewater treatment technique incorporating a liquid phase bioreactor (similar to a conventional aeration system) with a membrane solids/liquid separation unit. The MBR deletes the need for secondary clarification and tertiary filtration, and provides a high quality effluent. Membranes are typically broken into two major groups: flat plate and hollow tube. Each type of membrane has its own set of advantages and disadvantages.

Operating at high MLSS concentrations, the MBR provides advantages which include the following:

1. Higher loading rates and shorter reactor hydraulic retention times
2. Longer solids retention time (SRT) resulting in less sludge production
3. Long SRT designs while operating at low DO concentrations
4. High quality effluent in terms of low turbidity, bacteria, TSS, and BOD
5. Less spatial consideration required for wastewater treatment.

The disadvantages of the MBR are the relatively high initial capital, requirement of measures to control membrane fouling, and limited knowledge of the potential operational life and maintenance.

For the Indian Lake facility, the promise of using existing tanks at the facility to reduce the capital cost for new construction makes the MBR a feasible solution to the future expected treatment requirements. The membrane units would be placed sideline to the existing aeration tanks, which would be split into anoxic and aerobic sections. Recirculation pumps would be employed to return aerated mixed liquor to the anoxic basin at rates to promote denitrification. Using the existing footprint, the peak flow through the units would be approximately 8.8 mgd, which is less than the 9.2 mgd peak flow that could be treated through the secondary clarifiers. This also affects the sizing of the equalization basin.

One of the advantages of building the membrane tanks "sideline" to the existing aeration basins is the existing system could be used without significantly affecting the treatment process for extended periods during construction. The estimated cost for installing the membranes in new tanks would be approximately $7,563,000.

With installing the membrane units in the footprint of the existing aeration basins and using one of the primary clarifiers for anoxic treatment, the County could realize additional cost reductions. This would result in less new construction, but would require more attention to the treatment process, as longer disruptions would be needed to facilitate construction. The estimated cost for installing the membranes in new tanks would be approximately $7,460,000.

Return Activated Sludge (RAS) and Waste Activated Sludge (WAS)

In the 2003 Indian Lake WPCP Solids Evaluation the majority of the concerns with the current facility were directly related to the sludge pumping. The raw sludge pumps and primary clarifiers had problems with transferring the "sugar sand" grit that is common to the area. The LCWPC staff has replaced the centrifugal pumps with positive displacement pumps that appear to have corrected the situation. However, with the possibility of changes to both the liquid train (removal of primary clarifiers) and solids train, the RAS/WAS Pump Station may need to be reconfigured to compliment future needs. The estimated construction cost for changes to the pump station and related piping will be different for each option and this cost will be developed in the next chapter.

TERTIARY TREATMENT

As previously mentioned, TMDL limits are currently being developed for all watersheds within the State of Ohio. As limits on "standard" contaminants (CBOD and TSS) become more stringent, municipalities will need to install tertiary treatment to meet NPDES limits.

For the most part, tertiary treatment is a purely physical treatment technique, though lagoons have been used in the past to meet tertiary treatment limits. Commonly, a filtration medium is used to capture suspended solids, and once solids accumulation begins to interfere

with the filtration process, the medium is backwashed or cleaned. The most common method of filtration is the rapid sand filter. Other clarification techniques can be used, such as DensaDeg by Infilco Degremont and ActiFlo by Kruger/US Filter; however, for purposes of this report, rapid sand filters will be used for estimating a cost. The estimated cost for installing rapid sand filters would be approximately $2,500,000.

Tertiary treatment is currently employed at sites that have stringent effluent limits, especially those facilities with high-quality ratings on the receiving stream. For the Indian Lake facility, the use of tertiary treatment would be required if the future TMDL criteria for the Great Miami River required stringent CBOD and TSS discharge criteria. However, as the TMDL is not anticipated until 2010 and costs are relatively high, it may not be necessary to proceed with tertiary treatment design at this time. This option, along with the above-noted biological treatment and secondary clarifier improvements, will be compared to installing MBR technology for meeting tertiary treatment effluent limits.

POST TREATMENT

Post treatment at the current Indian Lake facility includes disinfection (chlorination and dechlorination) and post aeration (cascade aeration). With the design peak flow through the plant not expected to change, the post aeration should continue to function properly over the planning period for the improvements. Different disinfection techniques will be discussed in this chapter.

Chlorine Addition

The major concerns with chlorine liquid-gas are not necessarily monetary in nature, but relate to safety problems in chemical handling. Though most problems with chlorine handling occur in transport, there is a risk associated with WWTP operator usage. Leaks can be caused

by gaps in fittings or, in worse case situations, involve damage to the chlorine cylinders. This is a risk not only to employees, but also to the general public.

With turbid wastewater, such as the bypass stream at the Indian Lake facility, chlorine disinfection would be preferred, as the chemical is in contact with the solids for a much longer period (minimum of 30 minutes) and can penetrate solids to reach the pathogens. Should the County decide to continue with chlorine disinfection, all the existing equipment should be replaced with new. The estimated construction cost for replacing the current disinfection equipment would be approximately $350,000. With the possibility of the removal of the bypass from the facility, the possibility of employing an ultraviolet radiation (UV) disinfection system exists.

Ultraviolet Radiation (UV)

Many WWTPs are currently switching from chemical disinfection to ultraviolet (UV) radiation. UV systems work by inactivating organisms by absorption of the light, which causes a photochemical reaction that alters the molecular DNA components important to cell function. As the UV rays enter the cell, the energy reacts with vital cell components, resulting in injury or death of the exposed cells and a reduction in pathogenic organisms. Replacement of the chlorine systems with UV systems has been recommended not only to eliminate the extra chemical costs, but also to improve the safety conditions at the plant. The advantages of the UV system are:

1. Eliminates chemical needs for chlorination/dechlorination process - leads to lower operating costs and decreases the safety concerns for the operators.
2. Reduces the "footprint" or physical area needed for disinfection.

3. Eliminates the possibility of further anti-degradation requirements for disinfection by-products (DBPs) most notably trihalomethanes (THMs).

One of the primary reasons why many plants are switching to UV systems for disinfection is that a UV system is easily retrofitted into an existing chlorine contact basin. The wastewater can flow parallel or perpendicular to the lamps (i.e. horizontal and vertical mounting). The estimated construction cost for installing new UV equipment into the existing chlorine contact tank would be approximately $400,000.

SOLIDS HANDLING

Sludge treatment refers to the managing of the sludges from the clarifiers until final disposal. Options exist for solids reduction, sludge stabilization, dewatering, and storage. The final product can be transferred to a landfill (current method) or land applied as Class A or Class B solids. The term biosolids is often used in sludge treatment. It refers to properly treated and stabilized sewage sludges. Along with stabilization issues, the existing press is approaching the end of its design life and will need to be replaced. Costs for dewatering and solids storage will be addressed in the next chapter.

Landfill Disposal

Prior to 2003, land application was the primary practice used currently for disposal of biosolids by the LCWPC. In the 2003 Biosolids Management Plan, the option to utilize landfill disposal was addressed. Currently, the LCWPC transports all waste biosolids to the Cherokee Run Landfill. Sampling is required to determine if the sludge is within acceptable parameters of the landfill, but the implementation of disposal lies squarely with the County.

With disposal rules for landfilling of biosolids much less stringent than land application, sludge stabilization would not be a consideration. Thus, the LCWPC would have the option to

remove the existing anaerobic digester equipment and replace with aerobic sludge holding equipment, such as an air diffuser system and decant capabilities. It would be assumed that the existing anaerobic tanks could be used for aerobic sludge holding. The estimated construction cost for installing new aeration equipment into the existing anaerobic digester tanks would be approximately $600,000.

An option for sludge volume reduction that is gaining popularity is the Cannibal process as marketed by US Filter. The Cannibal system is accomplished through an interchange recycle flow between the aerobic activated sludge process and a specially controlled side-stream bioreactor. In the interchange bioreactor, the mixed liquor enters a facultative environment (exhibiting simultaneous aerobic and anaerobic conditions), with a limited oxygen supply. The conditions in the environment reduce the oxidation-reduction potential (ORP) to low levels, which changes the bacterial colonies from aerobic to facultative. The facultative colonies destroy the aerobic bacteria in this basin. The interchange recycle is then transferred back to the aeration stage of the process, where the aerobic bacteria consume the facultative bacteria. A steady-state interchange of biological solids destruction and re-growth is established.

Trash, grit and inerts are removed from the process through the use of a solids separation module on the return sludge line.

Though this process has been used around the United States for approximately three years, only a couple of sites in the State of Ohio have begun construction. Questions do arise, as the "trash, grit, and inerts" removed from the return sludge line, though perhaps not biosolids, do greatly increase the amount of non-organic solids removed from the plant. Also, though solids wasting is greatly reduced, there will still be solids to remove over a period of

time. An issue with metals may exist, as the concentration of metals will increase with the long sludge age in the wasted solids, which could affect the possibility of disposing of the solids in a conventional landfill.

This alternative does use a concept that has been used for many years – the use of alternating between anaerobic and aerobic conditions for biosolids reduction. With a capital cost of several million dollars, it would not be recommended to currently pursue this option.

Class B Alternatives

As was discussed in Chapter Four, land application of biosolids for municipalities is split into two categories: Class A and Class B. Class B biosolids have been increasingly receiving more stringent guidelines and require a relatively high level of reporting. The most common methods of meeting Class B sludge are by anaerobic digestion or aerobic digestion. With the ever increasing cost of land applying Class B sludge and with the LCWPC already abandoning the previous Class B land application system, Class B will not be considered an option for the future WWTP improvements project.

Class A Alternatives

Class A biosolids are capable of being used in locations where commercial fertilizers are utilized. However, Class A biosolids do have relatively large capital and O&M costs associated.

Lime Stabilization

Lime stabilization, similar to the EnVessel Pasteurization process as developed by the RDP Technologies, Inc., is one method of meeting the requirements of Class A biosolids. Typically this process has five steps:

1. The ThermoBlender receives and preheats the biosolids.

2. Lime is added to the blender at a proportional feed rate to influent solids.

3. The blender mixes the slurry and heats to approximately 157 degrees F.

4. The slurry is then discharged into the pasteurization vessel.

5. The pasteurization vessel holds the material for approximately 30 minutes to maintain temperature over time. This temperature and time criteria meet the requirements of USEPA for Class A sludge.

The pasteurization process is not new for biological destruction, as it has been used for years in other markets, such as the dairy industry. Pasteurization temperatures kill pathogenic organisms, while the lime prevents re-growth of organisms. The result is a final product that is capable of extended storage times.

As the RDP process does include substantial amounts of lime to be added, a large amount of O&M costs will be associated with this treatment technique. Along with the additional costs, there will also be a challenge for the staff to deal with the consequent handling of the lime. For this to be a viable sludge-conditioning program for the LCWPC, additional cake storage would need to be constructed at the facility. The LCWPC has indicated that chemical treatment of sludge is not favored and this option will not be considered.

Autothermal Thermophilic Aerobic Digestion (ATAD)

Autothermal Thermophilic Aerobic Digestion (ATAD) is similar to conventional aerobic digestion, but it is run in the thermophilic temperature range. The first generation of ATAD systems fell into disfavor due to the odors associated with the process. The second generation (as is currently being marketed by Thermal Process Systems, Inc.) incorporates a scrubber and biofilter to treat the off-gas produced within the process.

In the ATAD process, reactors are insulated in order to conserve the internal heat and operate without a supplemental heat source. The majority of the heat is attributed to the exothermic microbial oxidation which occurs during the digestion process. The only other sources of heat are introduced by aeration and mixing hence the process is termed autothermal. A foam layer that generates on the solution contains high concentrations of biologically active solids. This layer serves as insulation for the reactor and improves oxygen transfer.

The ATAD process includes a preliminary thickening system, reactor(s), and post process storage. The thickening system (typically gravity or belt thickener) ensures that the sludge maintains a chemical oxygen demand appropriate for effective processing. Generally, two insulated reactors in series are enclosed and serve as the active and storage tanks of the ATAD process. Within the reactor, mixing, aeration, and foam control promote the digestion of biosolids. The off gas from the reactors is treated appropriately if necessary. The digested biosolids from the ATAD reactor are then sent to ATAD Storage. Because the high process temperatures, post process storage is required for cooling and solids consolidation. Relatively long detention times (greater than twenty days) supplement the final stage of ATAD and can even further increase the reduction of volatile solids.

The advantages associated with ATAD are:

- Decrease of retention times required to achieve a given suspended solids reduction
- Operate system with ease
- Reduce presence of bacteria and viruses (compared to anaerobic digestion)
- Attain pathogen reduction requirements of Class A biosolids.

For the Indian Lake facility, the existing anaerobic digester tanks can be converted to ATAD reactor and storage tanks without the construction of additional tanks. The floating covers would need to be replaced with fixed covers. A new ATAD building for the pumps and blowers required in the ATAD process may need to be constructed. The estimated cost for an ATAD system in the current anaerobic digesters is approximately $1,900,000.

Dryers

Dryers, as the name suggests, produce heat to evaporate latent water within the sludge to a moisture content below that achievable by conventional dewatering methods. This method, as exemplified with the Dragon Dryer Indirect Rotating Chamber Biosolids Dryer by Davco/US Filter, also meets the requirement of Class A sludge by holding the time and temperature of drying.

This method of treatment begins with dewatered sludge cake being fed into the dryer from a hopper with a variable speed transfer auger. Four gas burners are used to heat the sludge – three heat the dehydration chamber, while the fourth heats the oil in the thermal hot oil unit. The hot oil flows through an auger, which moves the dewatered sludge through the dehydration chamber, and provides additional indirect heat. As indirect heat is provided, the biosolids never come into contact with the heat source. Once the dried biosolids pass through the dehydration chamber, they are discharged onto a conveyor for transfer to a storage facility.

Of all of the Class A options noted in this section, this method has the highest upfront and O&M costs of the options. Several locations have noted a benefit of combining the ATAD system and the dryer in order to increase flexibility and reduce the sizing of the dryer. As this project is the most costly, it will not be further discussed in this report.

CONTROL & MONITORING

Supervisory control and data acquisition (SCADA) is an industrial measurement and control system which consists of a central master station, one or more remote stations, and a software package capable of monitoring and controlling remotely located field data elements. A SCADA system gathers information, transfers the information to a central site, alerts the master station, analyzes and controls as necessitated, and logically displays organized information.

Currently at the Indian Lake facility, all systems are managed by manual controls that have become outdated. A SCADA system would allow more flexibility in controlling operations with the following benefits:

- Centralize wastewater treatment control
- Increase reliability
- Improve treatment process automation.

By adjusting set points, operators can compensate for seasonal and wet weather flows. Operators can efficiently and effectively resolve problems from diagnostic displays which detect and identify problems.

Septage

Ten State Standards define septage as, "a general term for the contents removed from septic tanks, portable vault toilets, privy vaults, holding tanks, very small wastewater treatment plants, or semi-public facilities (i.e., schools, motels, mobile home parks, campgrounds, small commercial endeavors) receiving wastewater from domestic sources." Septage, compared to domestic wastewater, is high in organics, grease, hair, scum, and grit. Also, higher than

normal levels of phosphorous, NH_3-N, bacterial growth inhibitors, heavy metals, and cleaning material may be present in select instances. As a comparison, U.S. EPA issued a document in 1984 entitled "Septage Treatment and Disposal" (EPA-625/6-84-009) that listed average septage concentrations in the United States. The average contaminant TSS and BOD_5 concentrations in septage are 12,862 mg/L and 6,480 mg/L, respectively. A look at Ohio EPA recommended design conditions for municipal wastewater have TSS and BOD_5 concentrations of 200 mg/L and 240 mg/L, respectively. Given today's regulatory atmosphere, a major concern regarding septage receiving is the potential for the material to be high in mercury.

A septage receiving station at Indian Lake would consist of a packaged system located in a new building, which could monitor and track deliveries for easy billing. A system of holding tanks would contain the septage volume entering the receiving station. The screened septage would then be added to the wet stream at the influent pump station. Analyses of the samples would dictate the rate of addition of septage to the plant wastewater. The estimated construction cost of this alternative is $285,000.

CHAPTER SIX

PLANNED PROJECT

ALTERNATIVE EVALUATION

From the information provided in Chapter Five, a menu of options with the applicable preliminary costs was generated and discussed with LCWPC staff. These options were analyzed for operational and maintenance concerns, as well as capital costs. With the unknown impact of the future TMDLs on effluent limits, it was decided to investigate options that would provide a tertiary treatment quality effluent. For the tertiary treatment option, the site layout and block flow diagram are given in Plates 3 and 4, respectively. For the MBR option, the site layout and block flow diagram are given in Plates 5 and 6, respectively. The following is a process flow description for the Indian Lake facility:

Process Description

Raw wastewater from the collection system, including recycle flows and wastewater from Honda Transmission, enters the expanded wet well. Capacity in the wet well will be increased by expanding the dimensions and providing additional pumps within the well. This facility will be capable of transporting the future expected peak hourly flow of 13.59 mgd over to the new screen facility.

A new fine screen chamber will be constructed above the current grit/pre-aeration tanks. The chamber will house two fine screens, each capable of handling the peak flow through the plant. Screenings will be washed and compacted and final disposal will be at an approved landfill. The existing grit removal and pre-aeration equipment will be removed. The screening chamber will be located within a superstructure to ensure against freezing.

Considerations will be made for removing the screenings from the building to a location for refuse pickup.

Once the flow exits the screening chamber, it will enter the existing primary splitter box that will direct the peak design flow of the plant (9.4 mgd) along the remainder of the treatment train and any additional flow will be directed to the equalization basin. The equalization basin, an earthen tank constructed with a synthetic liner, will be capable of storing 1.5 million gallons of wastewater. Following reduction of flow rate below the set condition, the equalization pumps will transport the stored liquid back to the splitter box, where it can continue along the treatment train.

From the existing primary clarifier splitter box, flow enters the existing primary clarifier structure. The primary clarifiers, as previously discussed, will be divided into two separate sections – one for an anoxic zone and the other for aerobic conditions. A pump will be located in the common wall to ensure sufficient recycle between the aeration and anoxic zones. Mixers will be located within the anoxic zone to allow the wastewater to remain mixed without adding supplemental oxygen. The aerobic zone will include a new aeration system with diffusers and blowers.

Following the current primary clarifiers, flow will enter the existing aeration basin splitter box before entering the aeration tanks. The existing tanks will be fitted with a new diffuser system.

After aeration, flow then enters the new secondary clarifier splitter box. The existing two clarifiers will have the internal equipment replaced with new drives and scrapers. Also, two additional clarifiers will be constructed to allow the plant to receive the design peak hourly flow of 9.4 mgd. Along with the changes to the clarifiers, the sludge pumping will also need

to be reworked to allow WAS to go from the secondary clarifiers directly to the sludge train. This may include replacing the existing RAS pumps. Scum from the clarifiers will enter a sump and will be transported to the sludge treatment train for further processing. Chemical addition, alum or ferric chloride, will also be planned for phosphorous treatment. The chemical will be added to the clarifier splitter box to allow mixing before entering the clarifiers.

From secondary treatment, a new tertiary treatment facility will need to be planned to meet the expected future TMDL limits. As the current treatment train will not allow for the head losses associated with filtration, the wastewater will need to be pumped to disinfection following the filters. These pumps would then also function as the backwash feed pumps for cleaning of the filters.

The alternate to the secondary and tertiary separate processes is to construct a membrane bioreactor (MBR). From the weir box following preliminary screening, the flow would enter an anoxic zone with a two hour hydraulic residence time (HRT). Following anoxic treatment, the mixed liquor will flow to the aerobic zone of the MBR. Following conventional aeration, the mixed liquor is exposed to the membrane separation unit or zone.

From either tertiary or the MBR, flow would enter the new ultraviolet radiation (UV) disinfection process. The new UV system would be retrofitted into the existing chlorine contact tanks. Effluent from UV would then exit the plant from the existing discharge piping and enter the Great Miami River.

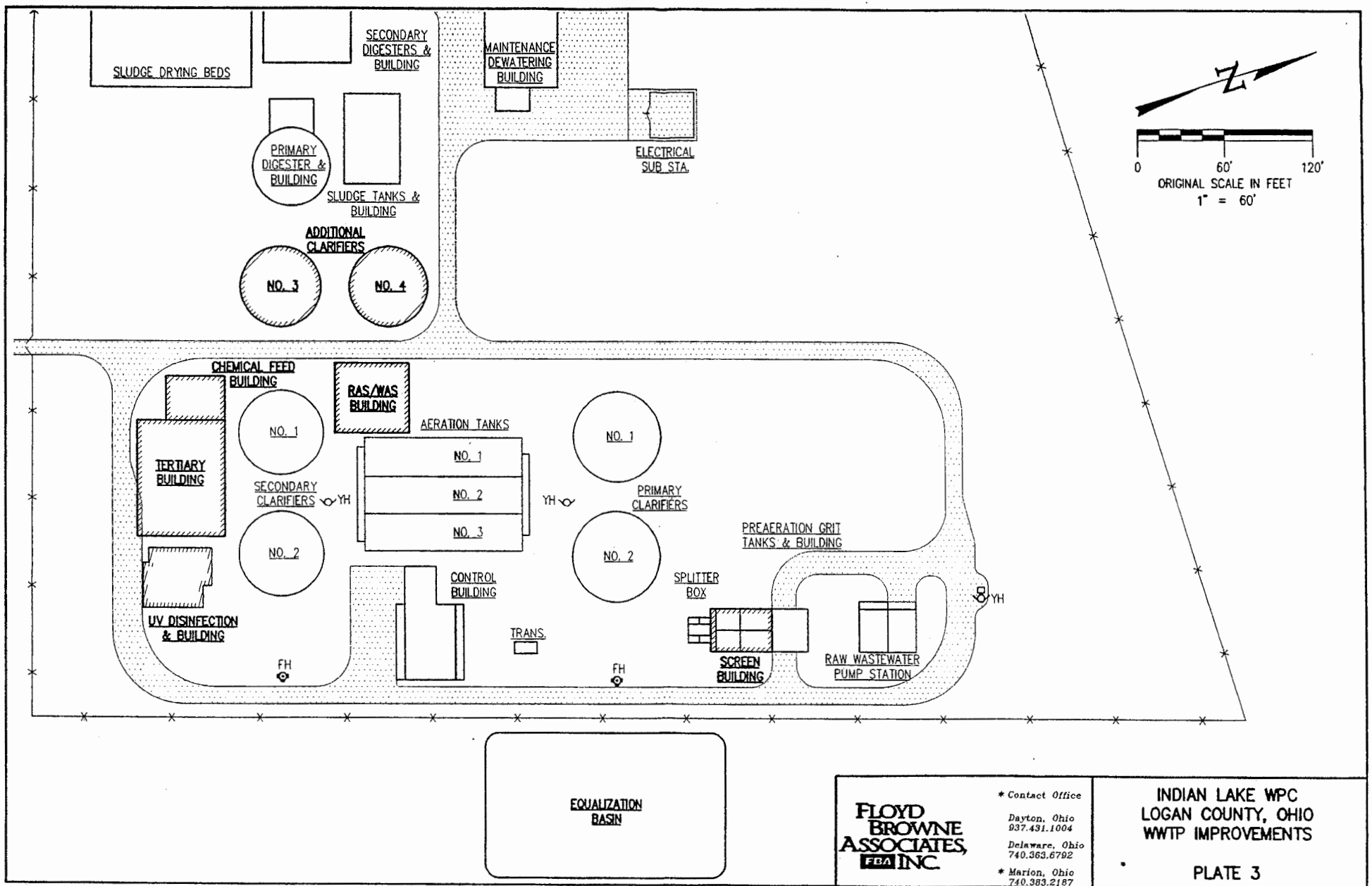
Waste sludge from the secondary clarifiers or MBR system will be pumped to the sludge treatment train. The existing anaerobic digesters will be retrofitted into aerobic digesters by adding aeration and decanting equipment. The decant will enter the drainage

system and be directed to the influent wet well. Digested sludge will be pumped to a new belt filter press for dewatering. Dewatered sludge will be conveyed to a sludge storage area, where sludge can be loaded directly into a trailer or can be stored for future transport to landfill.

The following table lists the estimated construction costs for each of the items discussed above:

TABLE NO. 6
ESTIMATED CONSTRUCTION COSTS FOR THE ALTERNATE PROCESSES

Item	Tertiary Option	MBR Option
Yard Grading and Piping	$,565,000	$200,000
Influent Pump Station	$320,000	$320,000
Influent Fine Screen and Weir Box	$635,000	$635,000
Demolition of Grit Equipment	$35,000	$35,000
Equalization Basin	$1,050,000	$1,100,000
Anoxic/Aeration System in Primaries	$460,000	
Diffuser Upgrade in Existing Aeration	$250,000	
New Secondary Clarifiers and Splitter Box	$1,400,000	
Rehab Existing Secondary Clarifiers	$370,000	
Tertiary Filters	$2,500,000	
RAS/WAS Pump Station	$820,000	
MBR System		$7,563,000
UV Disinfection	$400,000	$400,000
Aerobic Digestion	$600,000	$600,000
Sludge Handling Facility	$420,000	$420,000
Sludge Storage Facility	$180,000	$180,000
Septage Receiving	$285,000	$285,000
Instrumentation and Control	$450,000	$800,000
Contingency	$750,000	$750,000
Total Construction Costs	**$11,490,000**	**$13,288,000**
Project Costs – Eng, Legal, Permits, Etc.	$2,870,000	$2,870,000
Total Project Costs	**$14,360,000**	**$16,158,000**



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FLOYD BROWNE ASSOCIATES, INC FBA

* Contact Office
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Delaware, Ohio 740.363.6792
* Marion, Ohio 740.383.2187

INDIAN LAKE WPC
LOGAN COUNTY, OHIO
WWTP IMPROVEMENTS

PLATE 3

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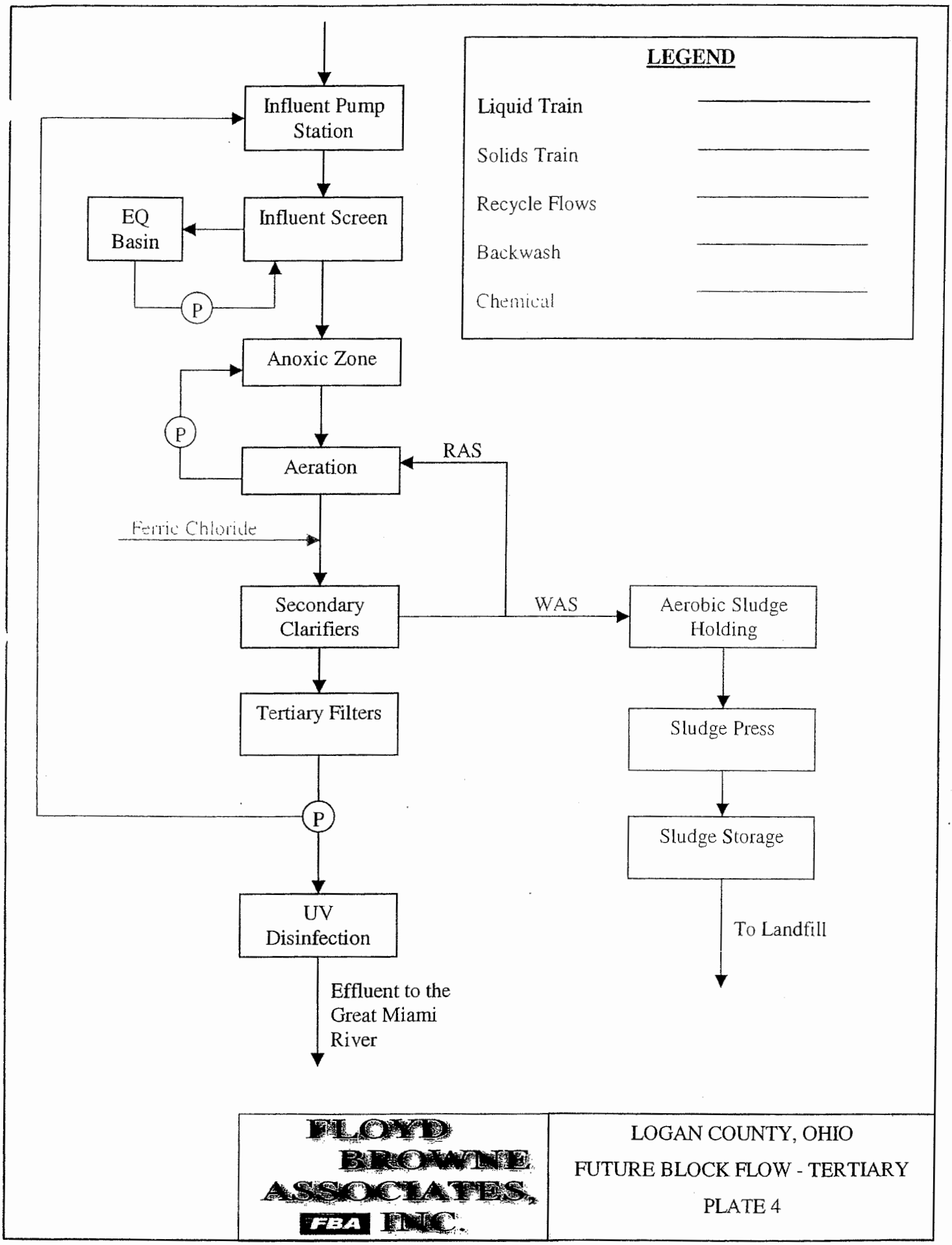
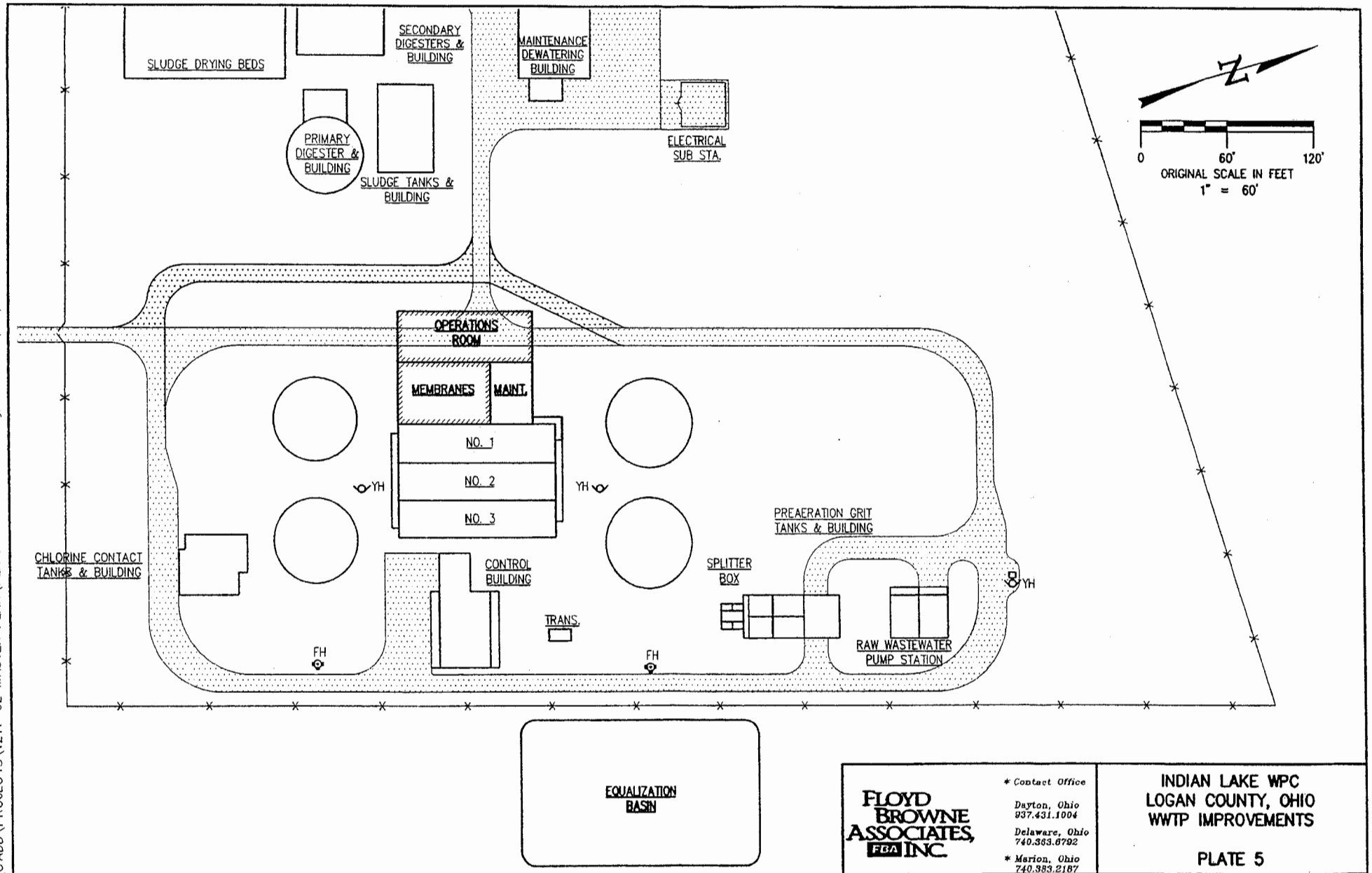


FLOYD BROWNE ASSOCIATES, INC. FBA

LOGAN COUNTY, OHIO

FUTURE BLOCK FLOW - TERTIARY

PLATE 4



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WWTP IMPROVEMENTS

PLATE 5

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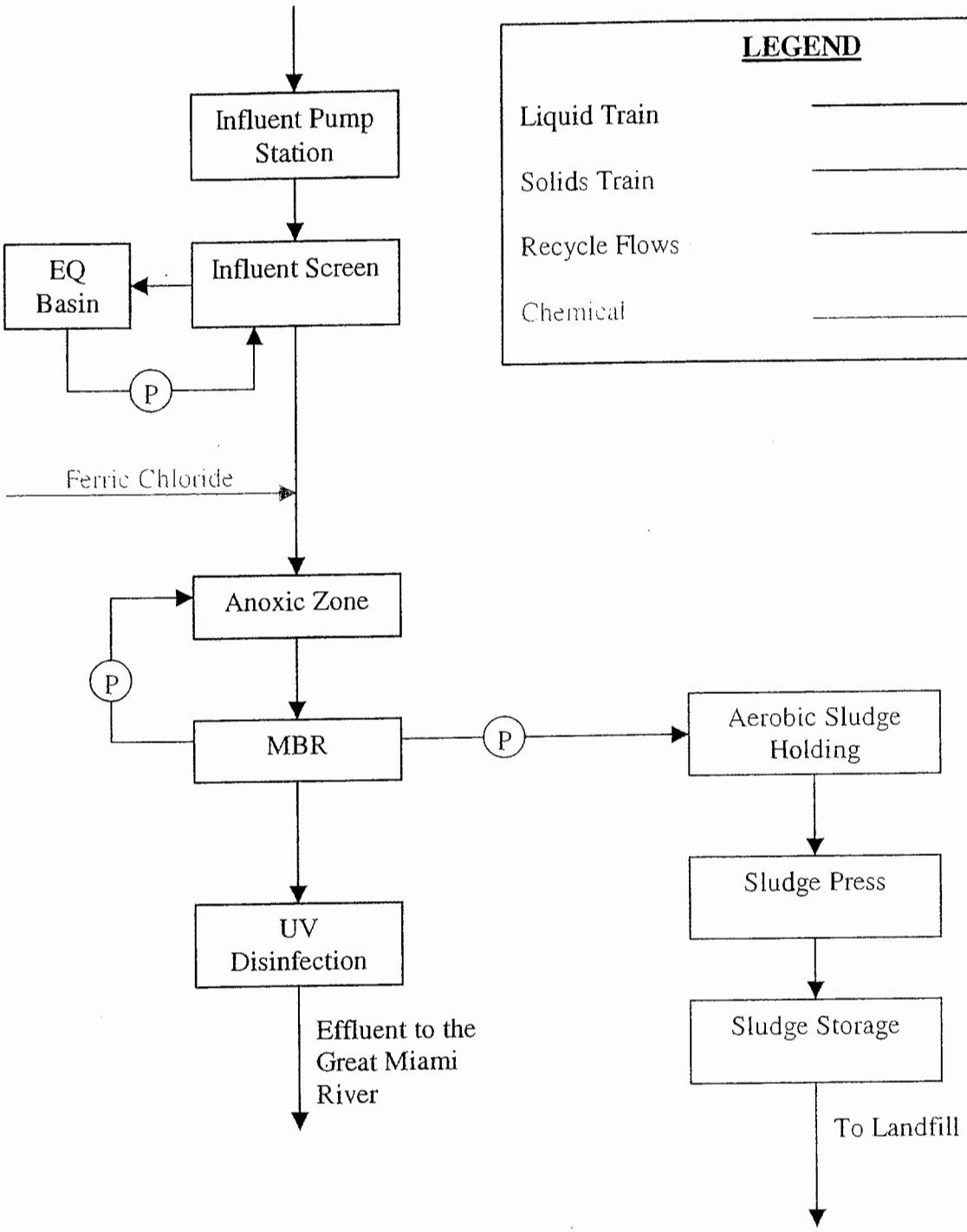


FLOYD BROWNE ASSOCIATES, INC.

LOGAN COUNTY, OHIO

FUTURE BLOCK FLOW - MBR

PLATE 6

April 1981
Revised August 1981
Revised January 1982

INDIAN LAKE
WASTEWATER TREATMENT PLANT
RUSSELLS POINT
LOGAN COUNTY, OHIO

BASIC DESIGN DATA

TREATMENT REQUIRED

NPDES Permit Number K602*AD (Expired June 30, 1977)

	30-Day Mean	7-Day Mean
BOD	8	12
SS	12	18
NH_3 (Summer) (Winter)	1.0 2.5	1.5 5.0
Phosphorus	1.0	1.5
Coliform, per 100 ml	200	400
pH	Limits of 6.0 to 9.0	
Chorine Residual	Maximum of 0.5 mg/l	
Dissolved Oxygen	Minimum of 6.0 mg/l	

Note: The latest permit expired on June 30, 1977. EPA has committed funding for this project with phosphorus removal and rapid sand filter tertiary treatment deleted from the design. It is assumed that the future permit limitations will be changed to reflect a secondary treated effluent with 30-day mean values between 20-30 mg/l BOD and SS and the phosphorus limitations will be dropped. The basic design data to follow is based on this assumption.

TREATMENT PROCESS

The treatment process consists of comminution, raw wastewater pumping, aerated grit removal, preaeration, primary clarification, single-stage activated sludge for nitrification, secondary clarification, and chlorination. Excess storm flow treatment consists of aerated grit removal, preaeration clarification, and chlorination. Polymer addition to aid secondary clarification. Sludge treatment consists of anaerobic digestion and mechanical dewatering.

DESIGN CRITERIA

Year		2000
	Winter	Summer
Population	7,500	20,000
Flows, mgd		
Average	2.3	2.2
Maximum	4.6	4.4
Peak[1]	8.3	8.3

[1] Peak storm flows in excess of the maximum design flow will receive comminution, aerated grit removal, preaeration clarification, and chlorination treatment only.

Influent Loadings and Per Cent Removals

	BOD		SS		NH_3-N	
	Winter	Summer	Winter	Summer	Winter	Summer
Raw, mg/l	70	185	70	185	13	10
, lbs/day	1,275	3,400	1,275	3,400	250	330
% Removal, Primary	35	35	60	60	-	10
% Removal, Secondary	85	85	70	70	92	92
% Removal, Overall	90	90	88	88	92	93
Effluent, mg/l	7	18	8	22	1.0	1.3
, lbs/day	134	330	153	404	19	17

TREATMENT

Comminutors

Number	2
Capacity, Each, mgd, Average	2.1 to 4.6
Capacity, Each, mgd, Peak	7.5

Raw Wastewater Pumps

Number	4
Capacity, Each, gpm	2,100
Hp, Each	40
Type of Drive	2 - Variable Speed 2 - Constant Speed

Aerated Grit Removal

Number	2
Size	13 ft W x 20 ft L x 9 ft-8 in AWD
Volume, Total, cf	5,025
Detention Time, Minutes @ 2.3 mgd	23
Air Supply Required, scfm, Total @ 5 scfm/ft of length	200

Note: Grit removal by screw conveyor, bucket elevator, and washer.

Preaeration

Number	2
Size	13 ft W x 20 ft L x 9 ft-8 in AWD
Volume, Total, cf	5,025
Detention Time, Minutes @ 2.3 mgd	23
Air Required, scfm, Total @ 5 scfm/ft of length	200

Aerated Grit - Preaeration Blowers

Number	2
Hp, Each	20
Capacity, Each, scfm	500*

*60 scfm provided for aeration tank influent channel mixing.

TREATMENT (Continued)

Primary Clarifiers

Number	2
Dimensions, Each	60 ft dia x 12 ft SWD
Surface Area, Total, sf	5,650
Overflow Rate, gpd/sf @ 2.3 mgd	410
@ 8.3 mgd	1,470
Volume, Total, cf	67,800
Detention Time, hrs @ 2.3 mgd	1.5
8.3 mgd	5.3
Weir Length, Total, ft	580
Weir Plate, gpd/ft @ 8.3 mgd	14,310

Aeration Tanks

Number	3
Dimensions, Each	25 ft W x 110 ft L x 15 ft SWD
Volume, Total, cf	123,750
Detention Time, hrs @ 2.3 mgd	9.6
Summer Loadings, lbs/day, Average	
BOD	2,300
NH_3-N	330
Volumetric Loadings, lbs/day/1,000 cf	
BOD	18.8
NH_3-N	2.7
Peak TKN Loading, lbs/day	845
Oxygen Required, lbs/day, Peak	
BOD: 2,300 x 1.5 lbs O_2/lbs BOD = 3,450	
TKN: 845 x 4.6 lbs O_2/lbs TKN = 3,890	
	7,340
Air Required, Total, peak	2,400

Blowers

Number	3
Hp, Each	100
Capacity, Each, scfm	1,250

TREATMENT (Continued)

Secondary Clarifiers

Number	2
Dimensions, Each	55 ft dia x 14 ft SWD
Effective Surface Area, Total, cf	4,120
Overflow Rate, gpd/sf @ 2.3 mgd	560
@ 4.6 mgd	1,165
Volume, Total, cf	66,500
Detention Time, hrs @ 2.3 mgd	5.2
Weir Length, ft	520
Weir Rate, gpd/ft @ 4.6 mgd	8,850

Chlorination

Contact Tanks

Number	2
Dimensions, Each	19 ft W x 34 ft-8 in L x 8 ft SWD
Volume, Total, cf	10,540
Detention Time, minutes @ 8.3 mgd	13*

Chlorine Requirements, lbs/day

@ 1.0 mgd, 4 mg/l	35
@ 2.3 mgd, 4 mg/l	80
@ 4.6 mgd, 8 mg/l	310
@ 8.3 mgd, 14 mg/l	970

*Approximately 1,100 ft of 36-in dia effluent discharge pipe from the chlorine contact tank to the Miami River provides an additional 10 minutes detention time at 8.3 mgd.

Chlorinators

Number	3
Capacity, Each, lbs/day	2 @ 200 1 @ 1,000

Note: All three chlorinators to have the capacity of 2,000 lbs/day. Two chlorinators to have 200 lbs/day metering tubes to operate in the 20 to 200 lbs/day range. One chlorinator to have 1,000 lbs/day metering tube to operate in the 100 to 1,000 lbs/day range. Automatic start of

TREATMENT (Continued)

Chlorination (Continued)

high range chlorinator when raw wastewater flow reaches 5.0 mgd and stops when flow drops below 5.0 mgd. High range chlorinator will be flow paced off of secondary bypass meter.

Post Aeration

Use a rip rapped effluent channel to provide the 6 mg/l dissolved oxygen requirement.

Sludge Production

Primary, lbs/day	2,380
Secondary, lbs/day	1,430
Storm Water, lbs/day, Average	170
Total, lbs/day	3,990

Anaerobic Digestors

First Stage	
Number	1
Dimensions	50 ft dia x 20 ft SWD
Volume, cf	39,270
Volatile Solids Loading, lbs/day/1,000 cf @ 70% Volatile Solids	71
Total Sludge to Digester, gpd @ 5% Solids	9,570
Detention Time, days	30
Second Stage	
Number (Existing)	2
Dimensions	26.5 ft x 26 ft x 25 ft SWD
Volume, Total, cf	34,450
Sludge Storage, days	27

Digested Sludge Well

Number	4
Dimensions, Each	18 ft W x 22 ft L x 7 ft-3 in AWD
Volume, Total, cf	11,485

TREATMENT (Continued)

Digester Sludge Well (Continued)

Note: Convert the two existing primary clarifiers for sludge well. Remove chain and flight sludge scraper equipment and effluent weir boxes. Install divider wall.

Sludge Dewatering (Belt Filter Press)

Dry Solids for Dewatering, lbs/hr (35 hrs/wk)	550
Number of Units	1

1. Size of belt filter press to be determined.
2. Sludge conditioning by polymer addition.
3. Sludge cake for landfill disposal will average 25% solids.

Stand-by Dewatering (Existing Sand Beds)

Number	6
Dimensions, Each	16.5 ft W x 100 ft L
Area, Total, sf	9,900
Loading, sf/capita, Summer	0.5
, Winter	1.3

Note: Additional stand-by to be provided by alternate disposal with liquid sludge hauling and land application.

Pumps

Number	Service	Capacity	Head	Rpm	Hp	
4	Raw Sewage	2100	45	1170	40	Constant Speed (2) Variable Speed (2)
3	RAS	1200	23	1170/880	10	Two-speed
2	Primary Sludge	200	33	1170	7½	"V" Belt Drive
2	Grease	200	33	1170	7½	"V" Belt Drive

Application No. OH0036641

Issue Date:

Effective Date:

Expiration Date: March 31, 2006

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

Logan County
Board of Commissioners

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Indian Lake Water Pollution Control District wastewater treatment works located at 1015 Orchard Island Road South, Russells Point, Ohio, Logan County and discharging to the Great Miami River in accordance with the conditions specified in Parts I, II, and III of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

_____
Christopher Jones
Director

Total Pages: 33

art I, A. - INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

. During the period beginning on the effective date of this permit and lasting until 24 months after the effective date of the permit, the ermittee is authorized to discharge in accordance with the following limitations and monitoring requirements from the following outfall: PK00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

able - Final Outfall - 001 - Interim

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
)010 - Water Temperature - C	-	-	-	-	-	-	-	1/Day	Continuous	All
)300 - Dissolved Oxygen - mg/l	-	5.0	-	-	-	-	-	1/Day	Multiple Grab	All
)515 - Residue, Total Dissolved - mg/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)530 - Total Suspended Solids - mg/l	-	-	45.0	30.0	-	783.0	522.0	3/Week	Composite	Winter
)530 - Total Suspended Solids - mg/l	-	-	30.0	20.0	-	522.0	348.0	3/Week	Composite	Summer
)552 - Oil and Grease, Hexane Extr ethod - mg/l	10.0	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
)610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	2.25	1.5	-	39.0	26.0	3/Week	Composite	Summer
)610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	12.75	8.5	-	222.0	148.0	3/Week	Composite	Winter
)630 - Nitrite Plus Nitrate, Total - mg/l	-	-	-	-	-	-	-	1/Month	Composite	All
)665 - Phosphorus, Total (P) - mg/l	-	-	-	-	-	-	-	1/Week	Composite	All
074 - Nickel, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
094 - Zinc, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
113 - Cadmium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
114 - Lead, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
118 - Chromium, Total Recoverable - /l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
119 - Copper, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	Composite	All
220 - Chromium, Dissolved Hexavalent - /l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly
616 - Fecal Coliform - #/100 ml	-	-	2000	1000	-	-	-	3/Week	Grab	Summer

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring	Sampling	Monitoring
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Frequency	Type	Months
9340 - Gamma-BHC, Total - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
9380 - Dieldrin, Whole Sample - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
0050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Continuous	All
0060 - Chlorine, Total Residual - mg/l	0.025	-	-	-	-	-	-	1/Day	Multiple Grab	Summer
0092 - Mercury, Total (Low Level) - ng/l	1600	-	-	26	0.028	-	0.0005	1/Month	Grab	All
1425 - Acute Toxicity, Ceriodaphnia lubia - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1426 - Chronic Toxicity, Ceriodaphnia lubia - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1427 - Acute Toxicity, Pimephales romelas - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1428 - Chronic Toxicity, Pimephales romelas - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1/Day	Multiple Grab	All
1942 - pH, Minimum - S.U.	-	6.5	-	-	-	-	-	1/Day	Multiple Grab	All
0082 - CBOD 5 day - mg/l	-	-	40.0	25.0	-	653.0	435.0	3/Week	Composite	Winter
0082 - CBOD 5 day - mg/l	-	-	23.0	15.0	-	391.0	261.0	3/Week	Composite	Summer

Notes for station 1PK00002001:

Effluent loadings based on average design flow of 4.6 MGD.
Total residual chlorine - See Part II, Item I.
Copper and Mercury - See Part I, C - Schedule of Compliance.
Mercury - See Part I, C and Part II, Item E.
pH - Critical values of minimum and maximum shall be reported daily.
Water Temperature - Report maximum temperature daily.
For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning 24 months after the effective date of the permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from the following outfall: 1PK00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1/Day	Continuous	All
00300 - Dissolved Oxygen - mg/l	-	5.0	-	-	-	-	-	1/Day	Multiple Grab	All
00515 - Residue, Total Dissolved - mg/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
00530 - Total Suspended Solids - mg/l	-	-	45.0	30.0	-	783.0	522.0	3/Week	Composite	Winter
00530 - Total Suspended Solids - mg/l	-	-	30.0	20.0	-	522.0	348.0	3/Week	Composite	Summer
00552 - Oil and Grease, Hexane Extr Method - mg/l	10.0	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	12.75	8.5	-	222.0	148.0	3/Week	Composite	Winter
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	2.25	1.5	-	39.0	26.0	3/Week	Composite	Summer
00630 - Nitrite Plus Nitrate, Total - mg/l	-	-	-	-	-	-	-	1/Month	Composite	All
00665 - Phosphorus, Total (P) - mg/l	-	-	-	-	-	-	-	1/Week	Composite	All
01074 - Nickel, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01094 - Zinc, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01113 - Cadmium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01114 - Lead, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01118 - Chromium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01119 - Copper, Total Recoverable - ug/l	62.0	-	-	41.0	1.08	-	0.71	1/Month	Composite	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly
31616 - Fecal Coliform - #/100 ml	-	-	2000	1000	-	-	-	3/Week	Grab	Summer

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
39340 - Gamma-BHC, Total - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
39380 - Dieldrin, Whole Sample - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Continuous	All
50060 - Chlorine, Total Residual - mg/l	0.025	-	-	-	-	-	-	1/Day	Multiple Grab	Summer
50092 - Mercury, Total (Low Level) - ng/l	1600	-	-	26	0.028	-	0.0005	1/Month	Grab	All
51425 - Acute Toxicity, Ceriodaphnia dubia - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
51426 - Chronic Toxicity, Ceriodaphnia dubia - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
51427 - Acute Toxicity, Pimephales promelas - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
51428 - Chronic Toxicity, Pimephales promelas - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
51941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1/Day	Multiple Grab	All
61942 - pH, Minimum - S.U.	-	6.5	-	-	-	-	-	1/Day	Multiple Grab	All
80082 - CBOD 5 day - mg/l	-	-	40.0	25.0	-	653.0	435.0	3/Week	Composite	Winter
80082 - CBOD 5 day - mg/l	-	-	23.0	15.0	-	391.0	261.0	3/Week	Composite	Summer

Notes for station 1PK00002001:

* Effluent loadings based on average design flow of 4.6 MGD.
- Total residual chlorine - See Part II, Item I.
- Mercury - See Part II, Item E and Part I,C. Schedule of Compliance.
- pH - Critical values of minimum and maximum shall be reported daily.
- Water Temperature - Report maximum temperature daily.
- For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

art I, B. - DOWNSTREAM-NEARFIELD MONITORING REQUIREMENTS

. Downstream-Nearfield Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, ıe permittee shall monitor the receiving stream, downstream of the point of discharge, at Station Number 1PK00002902, and report to the)hio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

'able - Downstream-Nearfield Monitoring - 902 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring	Sampling	Monitoring
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Frequency	Type	Months
1432 - 48-Hr. Acute Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
1435 - 96-Hr. Acute Toxicity Pimephales romela - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly

IOTES for Station Number 1PK00002902:

For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date f the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in ccordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly perating report form (Form 4500), including for the first three months after the effective date of the permit.

'art I, B. - DOWNSTREAM-FARFIELD MONITORING REQUIREMENTS

. Downstream-Farfield Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the ermittee shall monitor the receiving stream, downstream of the point of discharge, at Station Number 1PK00002903, and report to the Ohio PA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

'able - Downstream-Farfield Monitoring - 903 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring	Sampling	Monitoring
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Frequency	Type	Months
51438 - 7-Day Chronic Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
51441 - 7-Day Chronic Toxicity Pimephales promelas - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly

NOTES for Station Number 1PK00002903:

For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

Part I, B. - DOWNSTREAM-FARFIELD MONITORING REQUIREMENTS

. Downstream-Farfield Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the receiving stream, downstream of the point of discharge, at Station Number 1PK00002901, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Downstream-Farfield Monitoring - 901 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring	Sampling	Monitoring
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Frequency	Type	Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1/Month	Grab	All
00300 - Dissolved Oxygen - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00400 - pH - S.U.	-	-	-	-	-	-	-	1/Month	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
31616 - Fecal Coliform - #/100 ml	-	-	-	-	-	-	-	1/Month	Grab	Summer

NOTES for Station Number 1PK00002901:

* Water temperature, dissolved oxygen, pH, and fecal coliform - See Part II, Item E.

'art I, B. - SLUDGE MONITORING REQUIREMENTS

. Sludge Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall ıonitor the treatment works' final sludge at Station Number 1PK00002581, and report to the Ohio EPA in accordance with the following ıble. See Part II, OTHER REQUIREMENTS, for location of sludge sampling.

'able - Sludge Monitoring - 581 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
)0400 - pH - S.U.	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly
)0611 - Ammonia (NH3) In Sludge - ng/kg	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)0627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)0668 - Phosphorus, Total In Sludge - ng/kg	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)1003 - Arsenic, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1028 - Cadmium, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1029 - Chromium, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
01043 - Copper, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
01052 - Lead, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
01068 - Nickel, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
01093 - Zinc, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
01148 - Selenium, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
70316 - Sludge Weight - Dry Tons	-	-	-	-	-	-	-	1/Week	Total	All
70318 - Sludge Solids, Percent Total - %	-	-	-	-	-	-	-	1/Week	Grab	All
70322 - Sludge Solids, Percent Volatile - %	-	-	-	-	-	-	-	1/Week	Grab	All
71921 - Mercury, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
78465 - Molybdenum In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual

NOTES for Station Number 1PK00002581:

* Monitoring is required when sludge is removed from the wastewater treatment facility and disposed of by land application at agronomic rates. If no sludge is removed during the entire month, report "AL" in the first column of the first day of the month on the 4500 Form (Monthly Operating Report). If sludge is removed at least once during the month, report the appropriate values for sludge weight and sludge solids for the week(s) when sludge is removed; report "AH" for these parameters for weeks when sludge is not removed. A signature is still required.

Metal samples should be taken and reported in the months of June and December. If sludge is not hauled during June and December, then samples shall be taken and reported the next month that sludge is removed. At least two sets of samples for metal shall be taken and reported each year.

Nitrogen, pH, TKN, and phosphorus samples should be taken and reported in the months of March, June, September, and December. If sludge is not hauled during March, June, September, and December, then samples shall be taken and reported the next month that sludge is removed. At least four sets of samples for Nitrogen, pH, TKN, and phosphorus shall be taken and reported each year.

** Units of mg/kg are on a dry weight basis.

*** Sludge weight is a calculated total for the sampling period.

See Part II, Items K and N.

See Part I.C.3 - Schedule of Compliance.

Part I, B. - UPSTREAM MONITORING REQUIREMENTS

1. Upstream Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the receiving stream, upstream of the point of discharge at Station Number 1PK00002801, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Upstream Monitoring - 801 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1/Month	Grab	All
00300 - Dissolved Oxygen - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00400 - pH - S.U.	-	-	-	-	-	-	-	1/Month	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
31616 - Fecal Coliform - #/100 ml	-	-	-	-	-	-	-	1/Month	Grab	Summer
61432 - 48-Hr. Acute Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
61435 - 96-Hr. Acute Toxicity Pimephales promela - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
61438 - 7-Day Chronic Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
61441 - 7-Day Chronic Toxicity Pimephales promelas - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly

NOTES for Station Number 1PK00002801:

* Water temperature, dissolved oxygen, pH, ammonia-Nitrogen, and fecal coliform - See Part II, Item E.

For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

Part I, B. - INFLUENT MONITORING REQUIREMENTS

1. Influent Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the treatment works' influent wastewater at Station Number 1PK00002601, and report to the Ohio EPA in accordance with the following table. Samples of influent used for determination of net values or percent removal must be taken the same day as those samples of effluent used for that determination. See Part II, OTHER REQUIREMENTS, for location of influent sampling.

Table - Influent Monitoring - 601 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00530 - Total Suspended Solids - mg/l	-	-	-	-	-	-	-	3/Week	Composite	All
01941 - pH, Maximum - S.U.	-	-	-	-	-	-	-	1/Day	Multiple Grab	All
01942 - pH, Minimum - S.U.	-	-	-	-	-	-	-	1/Day	Multiple Grab	All
00082 - CBOD 5 day - mg/l	-	-	-	-	-	-	-	3/Week	Composite	All

Part I, C - Schedule of Compliance

1. Municipal Copper Schedule

This entity shall take actions described below as expeditiously as practicable, but not later than the dates developed in accordance with the following schedule.

The permittee shall attain compliance with the final effluent limitations of the permit for copper as expeditiously as practicable, but not later than the dates developed in accordance with the following schedule:

A. Not later than four (4) months after the effective date of this permit, the permittee shall submit a report to the Ohio EPA, Southwest District Office, describing the measures to be taken to achieve compliance with final effluent limitations for copper at outfall 1PK00002001. (Event Code 34099)

This report shall contain details of a plan to locate, isolate, and eliminate sources of copper to the sanitary sewers. It shall also include a schedule of implementation of the plan that specifies a deadline for compliance with the final effluent limitations for copper at outfall 1PK00002001. This compliance deadline shall not be later than two years after the effective date of this permit. When acknowledged as adequate by Ohio EPA, Southwest District Office in writing, this schedule shall be incorporated by reference as part of this permit.

B. Not later than twenty-four (24) months after the effective date of this permit, the permittee shall attain compliance with the final effluent limitations for copper at outfall 1PK00002001. (Event Code 88899)

2. Municipal Mercury Schedule

A. The permittee shall use EPA Method 1631, Revision B, to determine compliance with mercury effluent limits. The method detection level (MDL) for Method 1631 is 0.2 ng/l. The quantification level is 1.0 ng/l. Because the quantification level for Method 1631, Revision B, is lower than the mercury effluent limits, it is possible to directly evaluate compliance with the limits.

B. During the period beginning on the effective of this permit and lasting until this permit is modified or renewed, an interim quantification level (QL) of 1.0 ug/l (1000 ng/l) shall apply to analytical results reported for mercury. Any analytical result reported less than the interim QL shall be considered to be in compliance with that limit.

C. After this permit is modified and lasting until the expiration date of this permit, a final quantification level of 1.0 ng/l shall apply to analytical results reported for mercury, and the permittee shall have achieved full compliance with the final effluent table for outfall 1PK00002001.

REPORTING:

All analytical results, even those below the QL shall be reported. Analytical results are to be reported as follows:

i. Results above the QL: Report the analytical result for mercury.

ii. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

iii. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

D. Based on an evaluation of mercury data for outfall 1PK00002001 collected using Method 1631, the permittee shall submit one of the following to Ohio EPA not later than 19 Months from the effective date of this permit. (88899)

i. A letter stating that it intends to comply with the water quality based effluent limits for mercury included in the NPDES permit. In this case, the permit will be modified to remove the interim quantification level for mercury; or

ii. If the permittee believes that it will be able to take actions leading to compliance with the water quality based effluent limits for mercury included in this NPDES permit, it may submit a request to modify the NPDES permit to include a schedule of compliance and an interim effluent limit for mercury; or

iii. If the permittee determines that compliance with the water quality based effluent limits for mercury included in this permit is not possible without the construction of expensive end-of-pipe controls, a variance from the mercury water quality standards is available under section D(10) of rule 3745-33-07. If the permittee determines it is eligible, it may submit an application for coverage under this mercury variance. Section D(10)(a) of rule 3745-33-07 includes information on eligibility for coverage and lists the information that must be included in the application; or

iv. If the permittee determines that compliance with the water quality based effluent limits for mercury included in this permit is not possible, and it is not eligible for coverage under the mercury variance available at section D(10) of rule 3745-33-07, it may submit an application for an individual variance from water quality standards. Section (D)(1-3) of rule 3745-33-07 provides information on the applicability and conditions of an individual variance. Section (D)(4) of the rule lists the information that must be included in the application.

E. This permit may be modified to include either interim limits and a schedule of compliance or new limits and conditions if a variance is issued.

F. Copies of the final guidance document for the mercury variance and individual variance are available to permittees on request from Ohio EPA, Central Office, Division of Surface Water, Permits Section.

G. Letters or applications submitted under this item of the Schedule of Compliance shall be sent to the Division of Surface Water at the Ohio EPA Southwest District Office.

3. Municipal Sludge Schedule

The permittee shall submit to the appropriate Ohio EPA district office a substantially approvable sludge management plan as soon as possible, but no later than six (6) months after the effective date of this permit. (Event Code 95499)

This plan shall describe in detail the method or methods the entity intends to employ for the disposal or reuse of the sewage sludge generated by the facility. This plan shall also include an outline of all past and present sludge disposal practices.

Part II, Other Requirements

A. The wastewater treatment works must be under supervision of a Class III State certified operator as required by rule 3745-7- 02 of the Ohio Administrative Code.

B. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
1PK00002001	Final effluent from wastewater treatment plant prior to discharge to the Great Miami River. (Lat: 40 N 27 ' 36 "; Long: 83 W 54 ' 00 ")
1PK00002601	Raw sewage influent.
1PK00002581	Land application of liquid sludge at agronomic rates.
1PK00002801	Upstream sampling of outfall 001 in the Great Miami River at U.S. Route 33.
1PK00002901	Downstream sampling of outfall 001 in the Great Miami River at State Roue 708.
1PK00002902	Near-field (see Section 2, Part E of the reporting and testing guidance for biomonitoring).
1PK00002903	Far-field (see Section 3, Part E of the reporting and testing guidance for biomonitoring).

C. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and Holidays). On those days, report "AN" on the monthly report form.

D. Composite samples shall be comprised of a series of grab samples collected over a 24-hour period and proportionate in volume to the sewage flow rate at the time of sampling. Such samples shall be collected at such times and locations, and in such a fashion, as to be representative of the facility's overall performance.

E. Grab samples shall be collected at such times and locations, and in such fashion, as to be representative of the facility's performance.

F. Multiple grab samples shall be comprised of at least three grab samples collected at intervals of at least three hours during the period that the plant is staffed on each day for sampling. Samples shall be collected at such times and locations, and in such fashion, as to be representative of the facility's overall performance. The critical value shall be reported.

G. Effluent disinfection is not directly required, however, the entity is required to meet all applicable discharge permit limits. If disinfection facilities exist, they shall be maintained in an operable condition. Any design of wastewater treatment facilities should provide for the capability to install disinfection if required at a future time. Disinfection may be required if future bacteriological studies or emergency conditions indicate the need.

H. The treatment works must obtain at least 85 percent removal of carbonaceous biochemical oxygen demand (five-day) and suspended solids (see Part III, Item 1).

I. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the 40 CFR 136 promulgated analytical procedure for those parameters. In accordance with the ORC Section 6111.13 and OAC Rule 3745-33-07(C), if a discharge limit is set below the OEPA QL, any analytical result reported less than the OEPA QL shall be considered to be in compliance with that limit. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

Parameter	PQL	ML
Chlorine, Total Residual	0.050 mg/l	--

J. This permit may be modified, or alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

K. As soon as possible, but no later than six months after the effective date of this permit, the permittee shall sample, test, and submit the results of a sludge analysis for dioxin/dibenzofurans. The analysis shall be conducted on a composite, representative sample. The sample shall be representative of sludge removed to final disposal. The sample shall be a composite of at least one grab sample taken on each day which sludge is removed for final disposal over a five day period. The dioxin/dibenzofuran analysis will include:

1. Concentrations of dioxins reported as total concentration for each class 4 through 8 (class concentrations) and for all 2,3,7,8-congeners for each class 4 through 8(2,3,7,8-congener concentrations)

2. Concentrations of dibenzofurans reported as total concentration for each class 4 through 8 (class concentrations) and for all 2,3,7,8-congeners for each class 4 through 8 (2,3,7,8-congener concentrations)

The analysis shall be conducted following the procedures for Method 8290 as outlined in the most current edition of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846.

The analysis results will be reported showing individual isomer concentrations, total class concentration and a calculation of the Total Toxic Equivalence (TTE). If any individual isomer concentrations are less than the detection limit, a value of one-half (1/2) the detection level for that isomer will be used in the calculation of the TTE.

A sample analysis reporting form is available in the "Land Application of Sludge Manual"; Ohio EPA; September 28, 1998; pages 51 - 53.

The analysis results shall be submitted to: Ohio EPA; Division of Surface Water; Agriculture, Sludge and PTI Unit; Lazarus Government Center; P.O. Box 1049; Columbus, Ohio, 43216-1049.

L. POTWs that accept hazardous wastes by truck, rail, or dedicated pipeline are considered to be hazardous waste treatment, storage, and disposal facilities (TSDFs) and are subject to regulation under the Resource Conservation and Recovery Act (RCRA). Under the "permit-by-rule" regulation found at 40 CFR 270.60(c), a POTW must:

1) comply with all conditions of its NPDES permit,
2) obtain a RCRA ID number and comply with certain manifest and reporting requirements under RCRA,
3) satisfy corrective action requirements, and
4) meet all federal, state, and local pretreatment requirements.

M. Final permit limitations based on preliminary or approved waste load allocations are subject to change based on modifications to or finalization of the allocation or report or changes to Water Quality Standards. Monitoring requirements and/or special conditions of this permit are subject to change based on regulatory or policy changes.

Permit Guidance 11 Final	National Pollutant Discharge Elimination System (NPDES); Monitoring and Reporting for Sewage Sludge	
	Statutory references: ORC 6111.01, 6111.03, 6111.04 Rule references: OAC 3745-33, 3745-40	Ohio EPA, Division of Surface Water Revision 0, April 15, 2005
This internal guidance does not affect requirements found in referenced rule or statute.		

Purpose
To provide guidance for drafting the sewage sludge parts of a new NPDES permit or when renewing an existing NPDES permit.

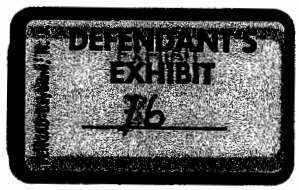
Background
Ohio NPDES permits have included 40 C.F.R. 503 compliant monitoring stations since 1993. Ohio adopted laws and rules for sewage sludge management in 2000 and 2002 respectively. Sewage sludge management was delegated to Ohio EPA as part of the NPDES permit program in 2005. The information in this guidance document is consistent with ORC Chapter 6111. and OAC Chapter 3745-40.

Procedure
Station tables, and the accompanying footnotes, outline the monitoring frequency requirements for sewage sludge disposal, use, storage, or treatment, by publicly owned treatment works and semi-public treatment works. Monitoring frequency requirements for sewage sludge stations are based on the dry weight of sewage sludge used or disposed in the most recent calendar year for which records are available. Monthly Operating Report (MOR) codes in **bold face** type are parameters that are required of any Permittee with such a sewage sludge station. Other parameters may be included on a case-by-case basis. On a case-by-case basis, monitoring may be necessary for parameters not listed in this guidance. In cases where additional monitoring is necessary, or when the proposed monitoring requirements are different from those of this guidance, the permit writer should document reasons for the changes. NPDES permit Part II and Part III guidance for sewage sludge is also provided in this document. Facsimile NPDES Part 1 stations are included as an appendix.

Industrial NPDES Permittee's may operate a domestic sewage package plant that is separate from the process wastewater collection and treatment system. If a permit writer is aware of such a situation, the industrial permit should have, at a minimum, a 586 station and/or a 588 station for the final disposal of sewage sludge removed from such treatment works.

Cross Reference
Permit Guidance 1 - National Pollutant Discharge Elimination System; Monitoring Frequency Requirements for Sanitary Discharges.

For More Information, Contact:
Ohio EPA, Division of Surface Water
Sewage Sludge Management Program
Chris Bowman (614) 644-2134 chris.bowman@epa.state.oh.us
Suzanne Matz (614) 644-2034 suzanne.matz@epa.state.oh.us



Station 581 - Monitoring requirements for land application of non-EQ sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Weight (B)	**US**	**70316**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Fee weight (C)	**US**	**51129**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Metals (D)	**mg/kg**	**varies**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Ammonia N	**mg/kg**	**00611**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Kjeldahl N	**mg/kg**	**00627**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
NO2/NO3 N (E)	mg/kg	00633	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Fecal coliform (F)	MPN/g	31641	2/Month T	1/Month T	1/Qtr T	2/Year T	1/Year T
Fecal coliform (F)	CFU/g	51131	2/Month T	1/Month T	1/Qtr T	2/Year T	1/Year T

Station 581 applies to land application of non-exceptional quality sewage sludge (the definition of "exceptional quality" is found in OAC rule 3745-40-01). Parameters in **bold** are required to be monitored by all Permittee's with a 581 station. Monitoring of other parameters, whether listed above or not, is at the discretion of the Director and depends in part on the treatment choices made by the Permittee. For example, if the Permittee utilizes class B pathogen reduction alternative 1 then one of the two Fecal coliform monitoring options must be chosen. The MPN/g option is recommended.

It is recommended that NPDES permits with a 581 station also include a 586 station and/or a 588 station as backup sewage sludge management alternatives.

Station 582 - Monitoring requirements for storage of sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)
			Any amount
Weight (B)	US tons	70316	1/Year T

Station 582 may be included in an NPDES permit at the discretion of the Director. The parameters to be included are at the discretion of the Director. The purpose of a station 582 is to ensure continued protection of public health and the environment when sewage sludge is stockpiled, stored in a field, or stored at the generating facility, and to provide the ability to track wastewater treatment plant operations over time.

Station 583 is reserved.

Station 584 - Monitoring requirements for land application of EQ sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Weight (B)	**US tons**	**70316**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Fee weight (C)	**US tons**	**51129**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Metals (D)	**mg/kg**	**varies**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Ammonia N	**mg/kg**	**00611**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Kjeldahl N	**mg/kg**	**00627**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
NO2/NO3 N (E)	mg/kg	00633	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Fecal coliform (G)	MPN/g	31641	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Salmonella sp. (G)	MPN/4g	71202	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Enteric virus (H)	PFU/4g	81401	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Helminth ova (I)	#/4g	51130	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C

Station 584 applies to land application of exceptional quality sewage sludge (the definition of "exceptional quality sludge" is fund in OAC rule 3745-40-01). Parameters in **bold** are required to be monitored by all Permittee's with a 584 station. Monitoring of other parameters, whether listed above or not, is at the discretion of the Director. All Permittee's must choose to monitor either Fecal coliform or Salmonella sp. to demonstrate pathogen reduction. The permit writer must determine which option the Permittee wishes to utilize and insert the choice in the 584 table.

It is recommended that all Permittee's that generate an exceptional quality sewage sludge also have a 581 station, for non-exceptional quality sewage sludge, for the times when the sewage sludge may not meet "EQ" criteria but still can be land applied as a non-exceptional quality sewage sludge. Including a 586 and/or 588 station as further backup is recommended.

Station 585 - Monitoring requirements for incineration of sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Fee weight (C)	**US tons**	**51129**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Metals (J)	**mg/kg**	**varies**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**

Station 585 applies to incineration of sewage sludge. Parameters in **bold** are required to be monitored by all Permittee's with a 585 station. Monitoring of other parameters would be included at the discretion of the Director.

Station 586 - Monitoring requirements for disposal of sewage sludge in a landfill

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)
			Any amount
Fee weight (C)	**US tons**	**51129**	**1/Year T**

Station 586 applies to sewage sludge disposed in a landfill. Parameters in **bold** are required to be monitored by all Permittee's with a 586 station. Monitoring of other parameters, whether listed above or not, are included at the discretion of the Director. Permittee's with a 581 and/or 584 station are recommended to include a 586 station in their NPDES permit. The back-up ability to landfill sewage sludge is considered a prudent management practice.

Station 587 is reserved.

Station 588 - Monitoring requirements for transfer of sewage sludge to another NPDES permit holder

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)
			Any amount
Weight (B)	US tons	70316	1/Year T
Volume (K)	Gals	80991	1/Year T

Station 588 applies to sewage sludge transferred to another NPDES Permittee. Since OAC 3745-40 requires any person who disposes, uses, stores or treats sewage sludge to have an NPDES permit for the activity, sewage sludge should only be transferred to an NPDES permit holder whose permit allows for the disposal, use, storage, or treatment of sewage sludge. Permittee's with a 581 and/or 584 station are recommended to include a back-up 588 station in their NPDES permit. The annual total of sewage sludge transferred may be reported in dry tons, or gallons, at the discretion of the Director (gallons is often preferred especially for small treatment works that hire a waste hauler to remove relatively small volumes of sewage sludge).

Station 589 - Monitoring requirements for other disposal, use, storage, or treatment of sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Weight (B)	US tons	70316	2/Month T	1/Month T	1/Qtr T	2/Year T	1/Year T

Station 589 should be used on a case-by-case basis, at the discretion of the Director, when sewage sludge disposal, use, storage, or treatment does not fit one of the other sewage sludge stations. The parameters to be included are at the discretion of the Director. Discharge limitations should reflect exceptional quality sewage sludge requirements or non-exceptional quality sewage sludge requirements, when applicable. Example: Some municipalities have been involved in a long term surface disposal project at the PPG Lime Lakes. Station 589 could be used to customize reporting requirements for the PPG Lime Lakes project.

Footnotes

C = composite, T = total

(A) All units are dry weight basis (except Volume in gallons).

(B) Weight means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming material or bulking agents. Sewage sludge monitoring frequency is based on the annual sewage sludge weight, in dry US tons, for the most recent calendar year per rule 3745-40-06 of the Ohio Administrative Code [Note: both Weight and Fee weight must be included as parameters for land application, incineration and landfill disposal sewage sludge stations. Ohio EPA must track Fee weight as per the ORC, and Weight for numerous reasons including Clean Water Act regulations (503)].

(C) Fee weight means the weight of sewage sludge, in dry U.S. tons, excluding any admixtures such as liming material or bulking agents. Annual sewage sludge fees are based on the most recent calendar year generation of sewage sludge per Section 3745.11(Y) of the Ohio Revised Code [Note: both Weight and Fee weight must be included as parameters for land application, incineration and landfill disposal sewage sludge stations. Ohio EPA must track Fee weight as per the ORC, and Weight for numerous reasons including Clean Water Act regulations (503)].

(D) The following metals shall be monitored when sewage sludge is applied to the land:
Arsenic, Total In Sludge - MOR code 01003
Cadmium, Total In Sludge - MOR code 01028
Copper, Total In Sludge - MOR code 01043
Lead, Total In sludge - MOR code 01052
Mercury, Total In Sludge - MOR code 71921
Molybdenum, Total In Sludge - MOR code 78465
Nickel, Total In Sludge - MOR code 01068
Selenium, Total In Sludge - MOR code 01148
Zinc, Total In Sludge - MOR code 01093

(E) Monitoring for nitrite/nitrate nitrogen is recommended for composted sewage sludge, aerobically digested sewage sludge, and air dried sewage sludge. These aerobic processes promote the nitrification of ammonia. Other sewage sludge treatment processes do not promote the nitrification of significant ammonia and monitoring for nitrite/nitrate nitrogen is not required.

(F) Monitoring for fecal coliform is required for class B pathogen reduction alternative 1. Seven separate composite samples of the sewage sludge, said samples recommended to be taken at two day intervals, shall be submitted for analysis using either the most probable number (MPN/g, MOR code 31641) method or the colony forming unit (CFU/g, MOR code 51131) method. The MPN/g method is recommended (further information on the methods of analysis, and the calculation of a geometric mean based on the analysis, is available in DSW Policy 0100.028). The number to be submitted on the MOR is the calculated total geometric mean of the seven representative samples.

(G) Monitoring for fecal coliform (or Salmonella sp. bacteria, see below) is required for all class A pathogen reduction alternatives. For fecal coliform the most probable number (MPN/g, MOR code 31641) is the required monitoring methodology.

Salmonella sp. monitoring (MPN/4g, MOR code 71202) may be substituted for the fecal coliform monitoring for class A pathogen reduction alternatives. This is not recommended. Fecal coliform (MPN/g, MOR code 31641) is the recommended pathogen reduction monitoring method.

(H) Monitoring sewage sludge for the presence of enteric virus is required for class A pathogen reduction alternative 3 and class A pathogen reduction alternative 4.

(I) Monitoring sewage sludge for the presence of viable helminth ova is required for class A pathogen reduction alternative 3 and class A pathogen reduction alternative 4.

(J) The following metals shall be monitored when sewage sludge is fired in an incinerator:
Arsenic, Total In Sludge - MOR code 01003
Beryllium, Total In Sludge - MOR code 01013
Cadmium, Total In Sludge - MOR code 01028
Chromium, Total In Sludge - MOR code 01029
Lead, Total In sludge - MOR code 01052
Mercury, Total In Sludge - MOR code 71921
Nickel, Total In Sludge - MOR code 01068

(K) At the discretion of the Director, Permittee's may report sewage sludge gallons transferred to another facility rather than sewage sludge dry tons transferred to another facility. Total cumulative gallons transferred shall be tracked and reported annually.

Guidance for Part II, Other Parameters

The following paragraphs should be included in Part II for all POTWs that generate a sewage sludge:

> "All disposal, use, storage, or treatment of sewage sludge by the Permittee shall comply with Chapter 6111. of the Ohio Revised Code, Chapter 3745-40 of the Ohio Administrative Code, any further requirements specified in this NPDES permit, and any other actions of the Director that pertain to the disposal, use, storage, or treatment of sewage sludge by the Permittee".
>
> "Sewage sludge composite samples shall consist of six to twelve grab samples collected at such times and locations, and in such fashion, as to be representative of the facilities sewage sludge".
>
> "No later than January 31 of each calendar year the Permittee shall submit two (2) copies of a report summarizing the sewage sludge disposal, use, storage, or treatment activities of the Permittee during the previous calendar year. One copy of the report shall be sent to the Ohio EPA, Division of Surface Water, P.O. Box 1049, Columbus, Ohio 43216-1049, and one copy of the report shall be sent to the appropriate Ohio EPA District Office. The report shall be submitted on Ohio EPA Form 4229".
>
> "Each day when sewage sludge is removed from the wastewater treatment plant for use or disposal a representative composite sample of sewage sludge shall be collected and monitored for total solids. Results of the monitoring shall be used to calculate the total Sewage Sludge Weight (Monthly Operating Report code 70316) and total Sewage Sludge Fee Weight (Monthly Operating Report code 51129) for the reporting period specified by this NPDES permit. The results of the daily monitoring, and the weight calculations, shall be maintained on site for a minimum of five years. The test methodology used shall be Part 2540 G of Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992. To convert from gallons of liquid sewage sludge to dry tons of sewage sludge: dry tons = gallons x 8.34 (lbs/gallon) x 0.0005 (tons/lb) x decimal fraction total solids".

The following information shall be included in Part II of each NPDES permit issued to a POTW that land applies class B pathogen reduction treated sewage sludge (below the "sampling station" information is suggested): a list of the counties in which the POTW proposes to land apply class B sewage sludge to authorized sites.

> "The Permittee may request authorization of land application sites in the following Ohio counties:
> County A
> County B
> etc."

The following paragraph should be included in Part II of each NPDES permit issued to a POTW that has an average daily final effluent flow of 100,000 gpd or greater, and that land applies sewage sludge (has a 581 and/or a 584 station).

> "A grab sample of sewage sludge that has been treated to meet requirements for application to the land shall be monitored for dioxin, as the term dioxin is defined in rule 3745-40-01 of the Ohio Administrative Code, as per the monitoring frequency, methodologies and reporting requirements described in rule 3745-40-06 of the Ohio Administrative Code".

Guidance for Part III, General Conditions

The following definitions appear in Part III of NPDES permits.

1. "Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works as defined in section 6111.01 of the Revised Code. "Sewage sludge" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.

2. "Sewage sludge weight" means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming materials or bulking agents. Monitoring frequencies for sewage sludge parameters are based on the reported sludge weight generated in a calendar year (use the most recent calendar year data when the NPDES permit is up for renewal).

3. "Sewage sludge fee weight" means the weight of sewage sludge, in dry U.S. tons, excluding admixtures such as liming materials or bulking agents. Annual sewage sludge fees, as per section 3745.11(Y) of the Ohio Revised Code, are based on the reported sludge fee weight for the most recent calendar year.

RECORDS RETENTION

The Permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years except those records that pertain to sewage sludge disposal, use, storage, or treatment, which shall be kept for a minimum of five years, including:

1. All sampling and analytical records (including internal sampling data not reported);
2. All original recordings for any continuous monitoring instrumentation;
3. All instrumentation, calibration and maintenance records;
4. All plant operation and maintenance records;
5. All reports required by this permit; and
6. Records of all data used to complete the application for this permit for a period of at least three years, or five years for sewage sludge, from the date of the sample, measurement, report, or application.

SOLIDS DISPOSAL

Collected grit and screenings, and other solids other than sewage sludge, shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state, and in accordance with all applicable laws and rules.

Appendix: The following tables are facsimiles of the default stations that will be available in SWIMS. Parameters may need to be added on a case-by-case basis.

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 581 - Non-EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Daily Maximum	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		1/Year	Composite	December
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		1/Year	Composite	December
01003 - Arsenic, Total In Sludge - mg/kg	75	1/Year	Composite	December
01028 - Cadmium, Total In Sludge - mg/kg	85	1/Year	Composite	December
01043 - Copper, Total In Sludge - mg/kg	4,300	1/Year	Composite	December
01052 - Lead, Total In Sludge - mg/kg	840	1/Year	Composite	December
01068 - Nickel, Total In Sludge - mg/kg	420	1/Year	Composite	December
01093 - Zinc, Total In Sludge - mg/kg	7,500	1/Year	Composite	December
01148 - Selenium, Total In Sludge - mg/kg	100	1/Year	Composite	December
51129 - Sludge Fee Weight - Dry Tons		1/Year	Total	December
70316 - Sludge Weight - Dry Tons		1/Year	Total	December
71921 - Mercury, Total In Sludge - mg/kg	57	1/Year	Composite	December
78465 - Molybdenum, Total In Sludge - mg/kg	75	1/Year	Composite	December

NOTES for Station Number _581:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 582 - Stockpiled or Stored Sewage Sludge - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Daily Maximum	Measuring Frequency	Sampling Type	Monitoring Months
70316 - Sludge Weight - Dry Tons		1/Year	Total	December

NOTES for Station Number _582:
Monitoring is required when sewage sludge is stockpiled or stored. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

[NOTE: It is intended this station would be an annual reporting requirement regardless of the volume of dry tons of sewage sludge generated]

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring -584 -EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Monthly Average	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		1/Year	Composite	December
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		1/Year	Composite	December
01003 - Arsenic, Total In Sludge - mg/kg	41	1/Year	Composite	December
01028 - Cadmium, Total In Sludge - mg/kg	39	1/Year	Composite	December
01043 - Copper, Total In Sludge - mg/kg	1,500	1/Year	Composite	December
01052 - Lead, Total In Sludge - mg/kg	300	1/Year	Composite	December
01068 - Nickel, Total In Sludge - mg/kg	420	1/Year	Composite	December
01093 - Zinc, Total In Sludge - mg/kg	2,800	1/Year	Composite	December
01148 - Selenium, Total In Sludge - mg/kg	100	1/Year	Composite	December
31641 - Fecal Coliform in Sludge - MPN/g	1,000	1/Year	Composite	December
51129 - Sludge Fee Weight - Dry Tons		1/Year	Total	December
70316 - Sludge Weight - Dry Tons		1/Year	Total	December
71921 - Mercury, Total In Sludge - mg/kg	17	1/Year	Composite	December
78465 - Molybdenum, Total In Sludge - mg/kg	75	1/Year	Composite	December

NOTES for Station Number _584:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 585 - Sewage Sludge Incineration - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
01003 - Arsenic, Total In Sludge - mg/kg		1/Year	Total	December
01013 - Beryllium, Total In Sludge - mg/kg		1/Year	Total	December
01028 - Cadmium, Total In Sludge - mg/kg		1/Year	Total	December
01029 - Chromium, Total In Sludge - mg/kg		1/Year	Total	December
01052 - Lead, Total In Sludge - mg/kg		1/Year	Total	December
01068 - Nickel, Total In Sludge - mg/kg		1/Year	Total	December
51129 - Sludge Fee Weight - Dry Tons		1/Year	Total	December
71921 - Mercury, Total In Sludge - mg/kg		1/Year	Total	December

NOTES for Station Number _585:
Monitoring is required when sewage sludge is incinerated. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 586 - Sewage Sludge Disposal in a Mixed Solid Waste Landfill - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
51129 - Sludge Fee Weight - Dry Tons		1/Year	Total	December

NOTES for Station Number _586:
Monitoring is required when sewage sludge is removed from the Permittee's facility for disposal in a mixed solid waste landfill. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

[NOTE: It is intended this station would be an annual reporting requirement regardless of the volume of dry tons of sewage sludge generated]

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 588 - Sewage Sludge Transferred to Another NPDES Permit Holder - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
70316 - Sludge Weight - Dry Tons		1/Year	Total	December
80991 - Sludge Volume - Gallons		1/Year	Total	December

NOTES for Station Number _588:
Monitoring is required when sewage sludge is removed from the Permittee's facility for transfer to another NPDES permit holder. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

[NOTE: It is intended this station would be an annual reporting requirement regardless of the volume of dry tons of sewage sludge generated]

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 589 - Other Sewage Sludge Use or Disposal - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
70316 - Sludge Weight - Dry Tons		1/Year	Total	December

NOTES for Station Number _589:
Monitoring is required when sewage sludge is removed from the Permittee's facility for use or disposal. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

[NOTE: It is intended this station would be an annual reporting requirement regardless of the volume of dry tons of sewage sludge generated]

Example sewage sludge stations for ≥ 70 but < 320 dry tons sewage sludge per calendar year

[NOTE: See examples for < 70 dry tons for tables 582, 586, 588, and 589]

Table - Sewage Sludge Monitoring - 581 - Non-EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		2/Year	Composite	Semi-annual
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		2/Year	Composite	Semi-annual
01003 - Arsenic, Total In Sludge - mg/kg	75	2/Year	Composite	Semi-annual
01028 - Cadmium, Total In Sludge - mg/kg	85	2/Year	Composite	Semi-annual
01043 - Copper, Total In Sludge - mg/kg	4,300	2/Year	Composite	Semi-annual
01052 - Lead, Total In Sludge - mg/kg	840	2/Year	Composite	Semi-annual
01068 - Nickel, Total In Sludge - mg/kg	420	2/Year	Composite	Semi-annual
01093 - Zinc, Total In Sludge - mg/kg	7,500	2/Year	Composite	Semi-annual
01148 - Selenium, Total In Sludge - mg/kg	100	2/Year	Composite	Semi-annual
51129 - Sludge Fee Weight - Dry Tons		2/Year	Total	Semi-annual
70316 - Sludge Weight - Dry Tons		2/Year	Total	Semi-annual
71921 - Mercury, Total In Sludge - mg/kg	57	2/Year	Composite	Semi-annual
78465 - Molybdenum, Total In Sludge - mg/kg	75	2/Year	Composite	Semi-annual

NOTES for Station Number _581:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted in June and December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 70 but < 320 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring -584 - EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Monthly Average	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		2/Year	Composite	Semi-annual
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		2/Year	Composite	Semi-annual
01003 - Arsenic, Total In Sludge - mg/kg	41	2/Year	Composite	Semi-annual
01028 - Cadmium, Total In Sludge - mg/kg	39	2/Year	Composite	Semi-annual
01043 - Copper, Total In Sludge - mg/kg	1,500	2/Year	Composite	Semi-annual
01052 - Lead, Total In Sludge - mg/kg	300	2/Year	Composite	Semi-annual
01068 - Nickel, Total In Sludge - mg/kg	420	2/Year	Composite	Semi-annual
01093 - Zinc, Total In Sludge - mg/kg	2,800	2/Year	Composite	Semi-annual
01148 - Selenium, Total In Sludge - mg/kg	100	2/Year	Composite	Semi-annual
31641 - Fecal Coliform in Sludge - MPN/g	1,000	2/Year	Composite	Semi-annual
51129 - Sludge Fee Weight - Dry Tons		2/Year	Total	Semi-annual
70316 - Sludge Weight - Dry Tons		2/Year	Total	Semi-annual
71921 - Mercury, Total In Sludge - mg/kg	17	2/Year	Composite	Semi-annual
78465 - Molybdenum, Total In Sludge - mg/kg	75	2/Year	Composite	Semi-annual

NOTES for Station Number _584:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted in June and December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 70 but < 320 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 585 - Sewage Sludge Incineration - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
01003 - Arsenic, Total In Sludge - mg/kg		2/Year	Total	Semi-annual
01013 - Beryllium, Total In Sludge - mg/kg		2/Year	Total	Semi-annual
01028 - Cadmium, Total In Sludge - mg/kg		2/Year	Total	Semi-annual
01029 - Chromium, Total In Sludge - mg/kg		2/Year	Total	Semi-annual
01052 - Lead, Total In Sludge - mg/kg		2/Year	Total	Semi-annual
01068 - Nickel, Total In Sludge - mg/kg		2/Year	Total	Semi-annual
51129 - Sludge Fee Weight - Dry Tons		2/Year	Total	Semi-annual
71921 - Mercury, Total In Sludge - mg/kg		2/Year	Total	Semi-annual

NOTES for Station Number _585:
Monitoring is required when sewage sludge is incinerated. Monthly Operating Report (MOR) data shall be submitted in June and December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 320 but < 1,650 dry tons sewage sludge per calendar year

[NOTE: See examples for < 70 dry tons for tables 582, 586, 588, and 589]

Table - Sewage Sludge Monitoring - 581 - Non-EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		1/Quarter	Composite	Quarterly-Alt.
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		1/Quarter	Composite	Quarterly-Alt.
01003 - Arsenic, Total In Sludge - mg/kg	75	1/Quarter	Composite	Quarterly-Alt.
01028 - Cadmium, Total In Sludge - mg/kg	85	1/Quarter	Composite	Quarterly-Alt.
01043 - Copper, Total In Sludge - mg/kg	4,300	1/Quarter	Composite	Quarterly-Alt.
01052 - Lead, Total In Sludge - mg/kg	840	1/Quarter	Composite	Quarterly-Alt.
01068 - Nickel, Total In Sludge - mg/kg	420	1/Quarter	Composite	Quarterly-Alt.
01093 - Zinc, Total In Sludge - mg/kg	7,500	1/Quarter	Composite	Quarterly-Alt.
01148 - Selenium, Total In Sludge - mg/kg	100	1/Quarter	Composite	Quarterly-Alt.
51129 - Sludge Fee Weight - Dry Tons		1/Quarter	Total	Quarterly-Alt.
70316 - Sludge Weight - Dry Tons		1/Quarter	Total	Quarterly-Alt.
71921 - Mercury, Total In Sludge - mg/kg	57	1/Quarter	Composite	Quarterly-Alt.
78465 - Molybdenum, Total In Sludge - mg/kg	75	1/Quarter	Composite	Quarterly-Alt.

NOTES for Station Number _581:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted in March, June, August, and December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 320 but < 1,650 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring -584 - EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Monthly Average	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		1/Quarter	Composite	Quarterly-Alt.
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		1/Quarter	Composite	Quarterly-Alt.
01003 - Arsenic, Total In Sludge - mg/kg	41	1/Quarter	Composite	Quarterly-Alt.
01028 - Cadmium, Total In Sludge - mg/kg	39	1/Quarter	Composite	Quarterly-Alt.
01043 - Copper, Total In Sludge - mg/kg	1,500	1/Quarter	Composite	Quarterly-Alt.
01052 - Lead, Total In Sludge - mg/kg	300	1/Quarter	Composite	Quarterly-Alt.
01068 - Nickel, Total In Sludge - mg/kg	420	1/Quarter	Composite	Quarterly-Alt.
01093 - Zinc, Total In Sludge - mg/kg	2,800	1/Quarter	Composite	Quarterly-Alt.
01148 - Selenium, Total In Sludge - mg/kg	100	1/Quarter	Composite	Quarterly-Alt.
51129 - Sludge Fee Weight - Dry Tons		1/Quarter	Total	Quarterly-Alt.
70316 - Sludge Weight - Dry Tons		1/Quarter	Total	Quarterly-Alt.
71921 - Mercury, Total In Sludge - mg/kg	17	1/Quarter	Composite	Quarterly-Alt.
78465 - Molybdenum, Total In Sludge - mg/kg	75	1/Quarter	Composite	Quarterly-Alt.

NOTES for Station Number _584:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted in March, June, August, and December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 320 but < 1,650 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 585 - Sewage Sludge Incineration - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
01003 - Arsenic, Total In Sludge - mg/kg		1/Quarter	Total	Quarterly-Alt.
01013 - Beryllium, Total In Sludge - mg/kg		1/Quarter	Total	Quarterly-Alt.
01028 - Cadmium, Total In Sludge - mg/kg		1/Quarter	Total	Quarterly-Alt.
01029 - Chromium, Total In Sludge - mg/kg		1/Quarter	Total	Quarterly-Alt.
01052 - Lead, Total In Sludge - mg/kg		1/Quarter	Total	Quarterly-Alt.
01068 - Nickel, Total In Sludge - mg/kg		1/Quarter	Total	Quarterly-Alt.
51129 - Sludge Fee Weight - Dry Tons		1/Quarter	Total	Quarterly-Alt.
71921 - Mercury, Total In Sludge - mg/kg		1/Quarter	Total	Quarterly-Alt.

NOTES for Station Number _585:
Monitoring is required when sewage sludge is incinerated. Monthly Operating Report (MOR) data shall be submitted in March, June, August, and December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 1,650 but < 16,500 dry tons sewage sludge per calendar year

[NOTE: See examples for < 70 dry tons for tables 582, 586, 588, and 589]

Table - Sewage Sludge Monitoring - 581 - Non-EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		1/Month	Composite	All
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		1/Month	Composite	All
01003 - Arsenic, Total In Sludge - mg/kg	75	1/Month	Composite	All
01028 - Cadmium, Total In Sludge - mg/kg	85	1/Month	Composite	All
01043 - Copper, Total In Sludge - mg/kg	4,300	1/Month	Composite	All
01052 - Lead, Total In Sludge - mg/kg	840	1/Month	Composite	All
01068 - Nickel, Total In Sludge - mg/kg	420	1/Month	Composite	All
01093 - Zinc, Total In Sludge - mg/kg	7,500	1/Month	Composite	All
01148 - Selenium, Total In Sludge - mg/kg	100	1/Month	Composite	All
51129 - Sludge Fee Weight - Dry Tons		1/Month	Total	All
70316 - Sludge Weight - Dry Tons		1/Month	Total	All
71921 - Mercury, Total In Sludge - mg/kg	57	1/Month	Composite	All
78465 - Molybdenum, Total In Sludge - mg/kg	75	1/Month	Composite	All

NOTES for Station Number _581:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted each month. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 1,650 but < 16,500 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring -584 - EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Monthly Average	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In sludge - mg/kg		1/Month	Composite	All
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		1/Month	Composite	All
01003 - Arsenic, Total In Sludge - mg/kg	41	1/Month	Composite	All
01028 - Cadmium, Total In Sludge - mg/kg	39	1/Month	Composite	All
01043 - Copper, Total In Sludge - mg/kg	1,500	1/Month	Composite	All
01052 - Lead, Total In Sludge - mg/kg	300	1/Month	Composite	All
01068 - Nickel, Total In Sludge - mg/kg	420	1/Month	Composite	All
01093 - Zinc, Total In Sludge - mg/kg	2,800	1/Month	Composite	All
01148 - Selenium, Total In Sludge - mg/kg	100	1/Month	Composite	All
51129 - Sludge Fee Weight - Dry Tons		1/Month	Total	All
70316 - Sludge Weight - Dry Tons		1/Month	Total	All
71921 - Mercury, Total In Sludge - mg/kg	17	1/Month	Composite	All
78465 - Molybdenum, Total In Sludge - mg/kg	75	1/Month	Composite	All

NOTES for Station Number _584:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted each month. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 1,650 but < 16,500 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 585 - Sewage Sludge Incineration - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
01003 - Arsenic, Total In Sludge - mg/kg		1/Month	Total	All
01013 - Beryllium, Total In Sludge - mg/kg		1/Month	Total	All
01028 - Cadmium, Total In Sludge - mg/kg		1/Month	Total	All
01029 - Chromium, Total In Sludge - mg/kg		1/Month	Total	All
01052 - Lead, Total In Sludge - mg/kg		1/Month	Total	All
01068 - Nickel, Total In Sludge - mg/kg		1/Month	Total	All
51129 - Sludge Fee Weight - Dry Tons		1/Month	Total	All
71921 - Mercury, Total In Sludge - mg/kg		1/Month	Total	All

NOTES for Station Number _585:
Monitoring is required when sewage sludge is incinerated. Monthly Operating Report (MOR) data shall be submitted each month. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 16,500 dry tons sewage sludge per calendar year

[NOTE: See examples for < 70 dry tons for tables 582, 586, 588, and 589]

Table - Sewage Sludge Monitoring - 581 - Non-EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		2/Month	Composite	Bimonthly-Even
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		2/Month	Composite	Bimonthly-Even
01003 - Arsenic, Total In Sludge - mg/kg	75	2/Month	Composite	Bimonthly-Even
01028 - Cadmium, Total In Sludge - mg/kg	85	2/Month	Composite	Bimonthly-Even
01043 - Copper, Total In Sludge - mg/kg	4,300	2/Month	Composite	Bimonthly-Even
01052 - Lead, Total In Sludge - mg/kg	840	2/Month	Composite	Bimonthly-Even
01068 - Nickel, Total In Sludge - mg/kg	420	2/Month	Composite	Bimonthly-Even
01093 - Zinc, Total In Sludge - mg/kg	7,500	2/Month	Composite	Bimonthly-Even
01148 - Selenium, Total In Sludge - mg/kg	100	2/Month	Composite	Bimonthly-Even
51129 - Sludge Fee Weight - Dry Tons		2/Month	Total	Bimonthly-Even
70316 - Sludge Weight - Dry Tons		2/Month	Total	Bimonthly-Even
71921 - Mercury, Total In Sludge - mg/kg	57	2/Month	Composite	Bimonthly-Even
78465 - Molybdenum, Total In Sludge - mg/kg	75	2/Month	Composite	Bimonthly-Even

NOTES for Station Number _581:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted each month. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 16,500 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring -584 - EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Monthly Average	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In sludge - mg/kg		2/Month	Composite	Bimonthly-Even
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		2/Month	Composite	Bimonthly-Even
01003 - Arsenic, Total In Sludge - mg/kg	41	2/Month	Composite	Bimonthly-Even
01028 - Cadmium, Total In Sludge - mg/kg	39	2/Month	Composite	Bimonthly-Even
01043 - Copper, Total In Sludge - mg/kg	1,500	2/Month	Composite	Bimonthly-Even
01052 - Lead, Total In Sludge - mg/kg	300	2/Month	Composite	Bimonthly-Even
01068 - Nickel, Total In Sludge - mg/kg	420	2/Month	Composite	Bimonthly-Even
01093 - Zinc, Total In Sludge - mg/kg	2,800	2/Month	Composite	Bimonthly-Even
01148 - Selenium, Total In Sludge - mg/kg	100	2/Month	Composite	Bimonthly-Even
51129 - Sludge Fee Weight - Dry Tons		2/Month	Total	Bimonthly-Even
70316 - Sludge Weight - Dry Tons		2/Month	Total	Bimonthly-Even
71921 - Mercury, Total In Sludge - mg/kg	17	2/Month	Composite	Bimonthly-Even
78465 - Molybdenum, Total In Sludge - mg/kg	75	2/Month	Composite	Bimonthly-Even

NOTES for Station Number _584:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted each month. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for ≥ 16,500 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 585 - Sewage Sludge Incineration - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Maximum	Measuring Frequency	Sampling Type	Monitoring Months
01003 - Arsenic, Total In Sludge - mg/kg		2/Month	Total	Bimonthly-Even
01013 - Beryllium, Total In Sludge - mg/kg		2/Month	Total	Bimonthly-Even
01028 - Cadmium, Total In Sludge - mg/kg		2/Month	Total	Bimonthly-Even
01029 - Chromium, Total In Sludge - mg/kg		2/Month	Total	Bimonthly-Even
01052 - Lead, Total In Sludge - mg/kg		2/Month	Total	Bimonthly-Even
01068 - Nickel, Total In Sludge - mg/kg		2/Month	Total	Bimonthly-Even
51129 - Sludge Fee Weight - Dry Tons		2/Month	Total	Bimonthly-Even
71921 - Mercury, Total In Sludge - mg/kg		2/Month	Total	Bimonthly-Even

NOTES for Station Number _585:
Monitoring is required when sewage sludge is incinerated. Monthly Operating Report (MOR) data shall be submitted each month. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

OhioEPA

State of Ohio Environmental Protection Agency

Sewage Sludge Use or Disposal in Ohio - Calendar Year 2002

Prepared by:
Sewage Sludge Management Program
Permits and Compliance Section
Ohio EPA - Division of Surface Water

Sewage Sludge Use or Disposal in Ohio - Calendar Year 2002

Publicly owned treatment works and semi-public treatment works (hereinafter collectively referred to as POTWs) in Ohio are required to have an effective National Pollutant Discharge Elimination System (NPDES) permit to discharge treated effluent to waters of the State. Included in Part II of most NPDES permits is a requirement that an annual sewage sludge report, describing sewage sludge use or disposal activities for the previous year, be submitted to the Ohio Environmental Protection Agency (EPA). The purpose of this requirement is to provide information on sewage sludge management trends, to identify areas where Ohio EPA should focus its technical and compliance assistance efforts, and to provide data to support public education and outreach activities.

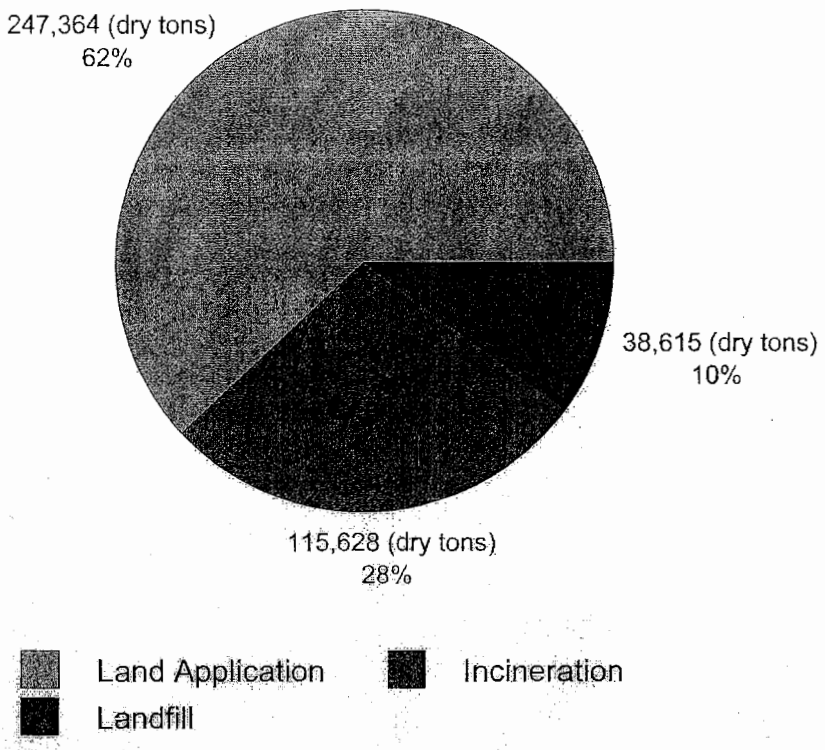
Each fall annual sewage sludge report forms and instructions are mailed to NPDES permit holders that are required to submit an annual sewage sludge report. When the forms for calendar year 2002 were mailed, 1,498 of the 1,587 NPDES permitted POTWs were required to submit an annual sewage sludge report. 1,319 completed annual sewage sludge reports were returned for calendar year 2002. A sewage sludge facility is classified as a major when it has an average daily effluent flow greater than or equal to one million gallons per day, or has an Ohio EPA approved industrial pretreatment program, or both. Major POTWs generate approximately ninety per cent of the sewage sludge in Ohio.

There are several means by which POTWs in Ohio use or dispose of sewage sludge. The most common are land application for agronomic benefit, incineration, and disposal in a landfill. Table 1 tabulates these three options as reported to Ohio EPA.

Table 1: Sewage Sludge Use or Disposal in Ohio; Calendar Year 2002

	Dry Tons	%
Land Application	247,364	62
Incineration	115,628	28
Landfill	38,615	10
Sub-Total	**401,607**	**100**
Out-of-State	17,728	
Total	**419,335**	

Figure 1: Sewage Sludge Use or Disposal in Ohio; Calendar Year 2002



Sewage Sludge Use or Disposal by Ohio EPA District

Ohio is one of the most diverse states in the country. This characteristic results from the high degree of variability in the topography, land use, geology, and geography across the State. These factors impact how Ohio municipalities use or dispose of the sewage sludge they generate. Figure 1 (above) shows the statewide totals for sewage sludge generated within the state. Figures 2 through 6, on subsequent pages, illustrate how POTWs in the five Ohio EPA Districts use or dispose of the sewage sludge they generate (see the Appendix for District Office boundaries). Note the significant quantities of sewage sludge land applied for agronomic benefit in the more rural areas of the state versus that incinerated in the major population centers of Ohio. Regardless of the Ohio EPA District, landfill rates are low.

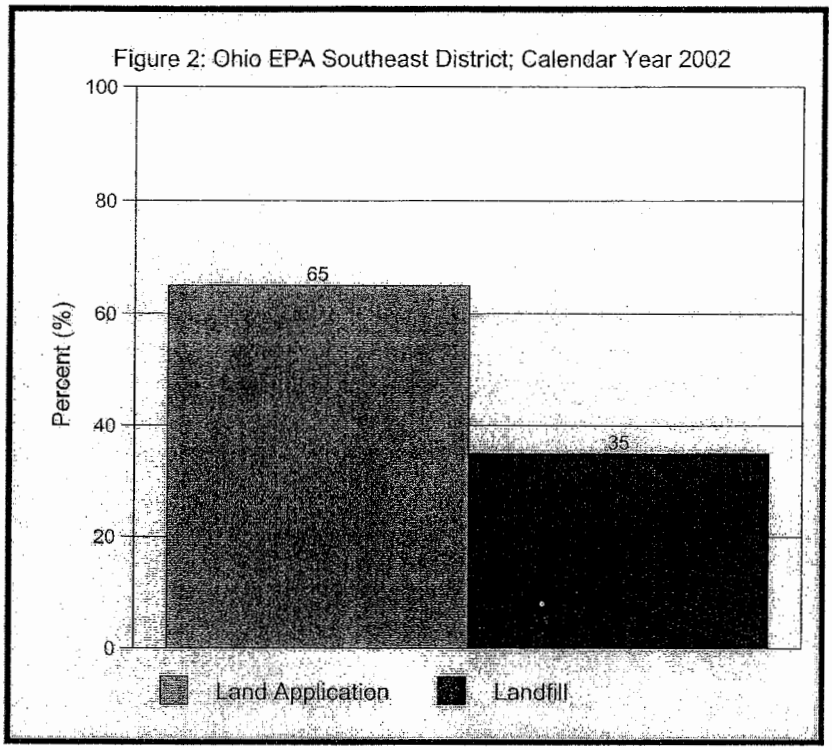


Figure 2: Ohio EPA Southeast District; Calendar Year 2002
100
80
60
40
20
0
Percent (%)
65
35
Land Application
Landfill

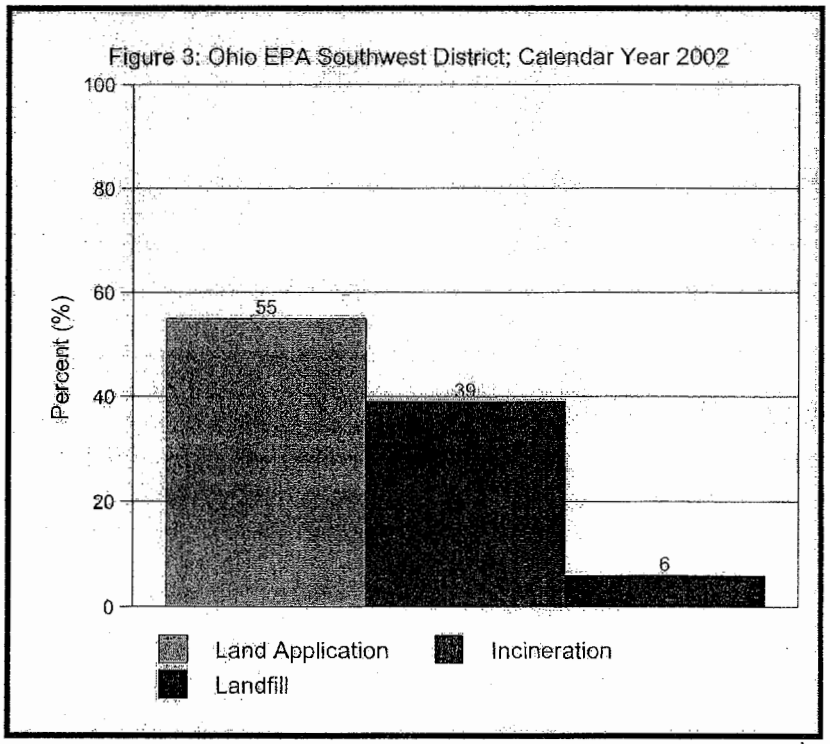


Figure 3: Ohio EPA Southwest District; Calendar Year 2002
100
80
60
40
20
0
Percent (%)
55
39
6
Land Application
Incineration
Landfill

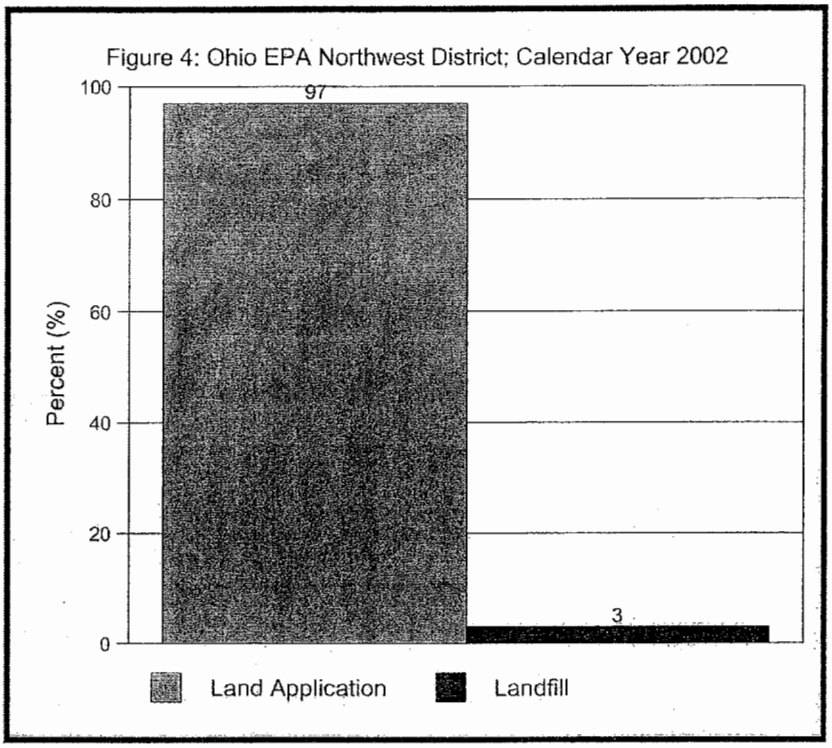


Figure 4: Ohio EPA Northwest District; Calendar Year 2002
Percent (%)
100
80
60
40
20
0
97
3
Land Application
Landfill

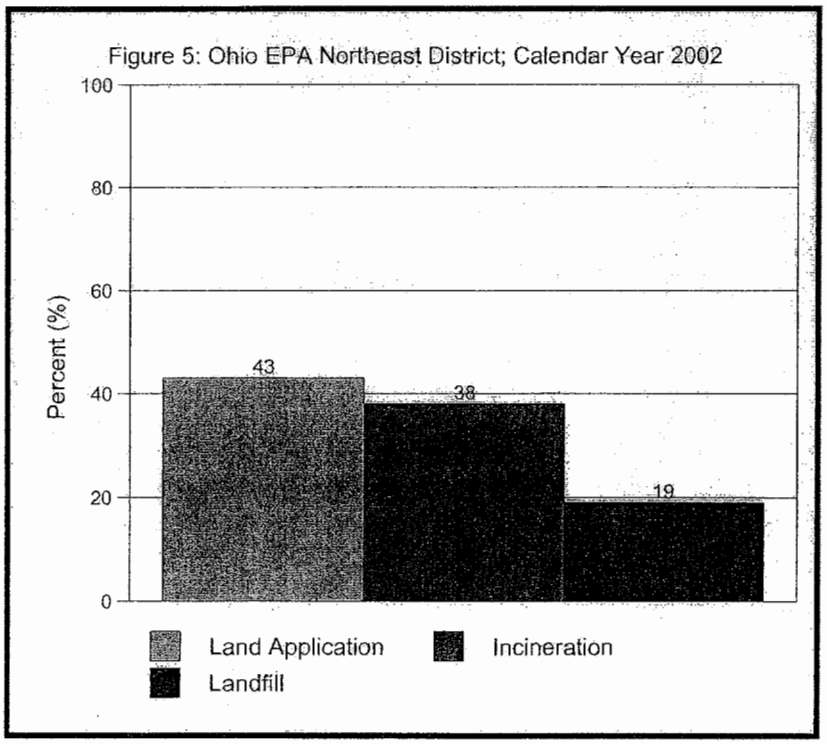
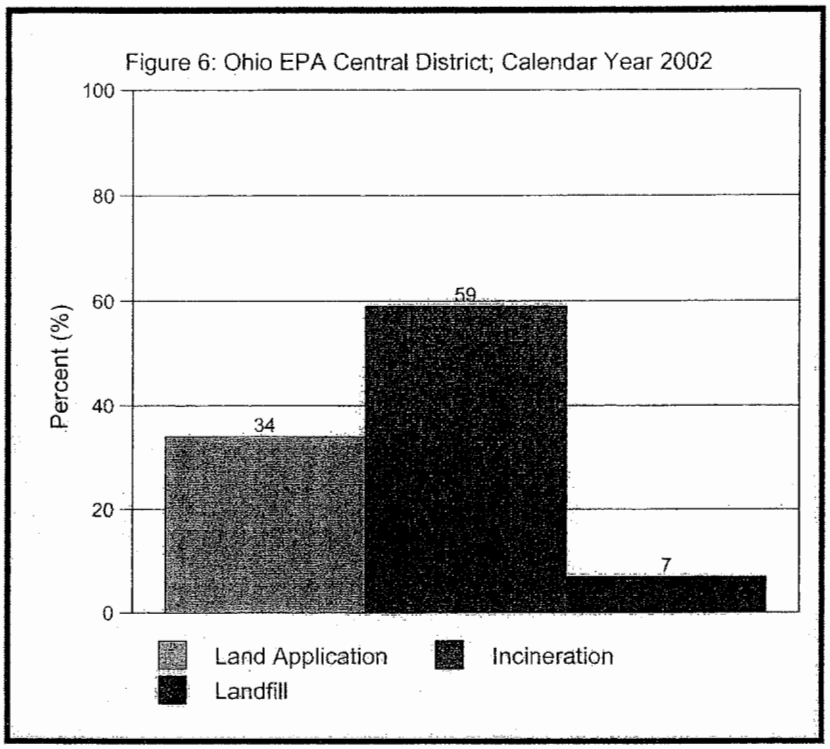
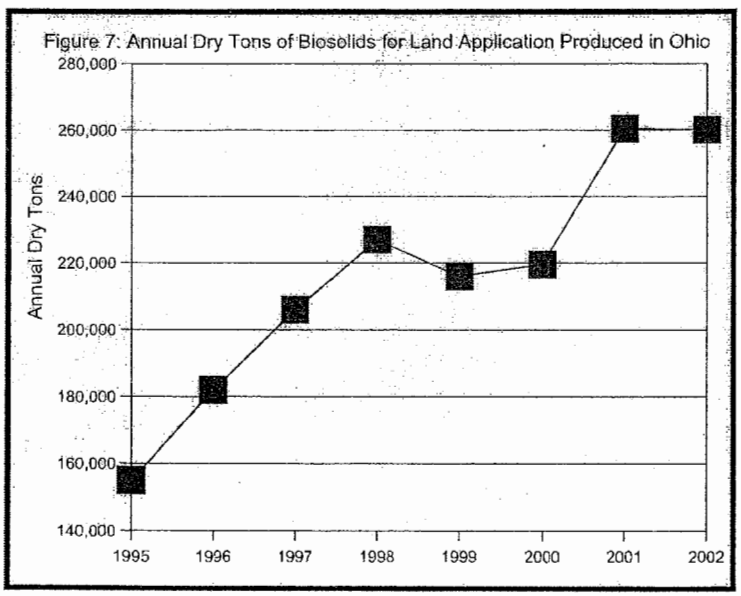


Figure 5: Ohio EPA Northeast District; Calendar Year 2002
Percent (%)
100
80
60
40
20
0
43
38
19
Land Application
Incineration
Landfill

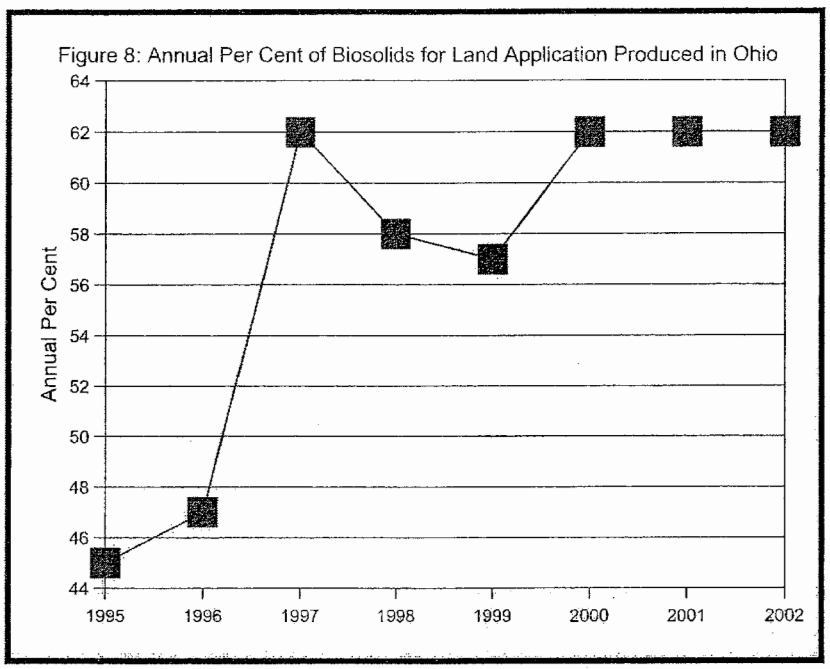


Trend in Biosolids Land Application in Ohio

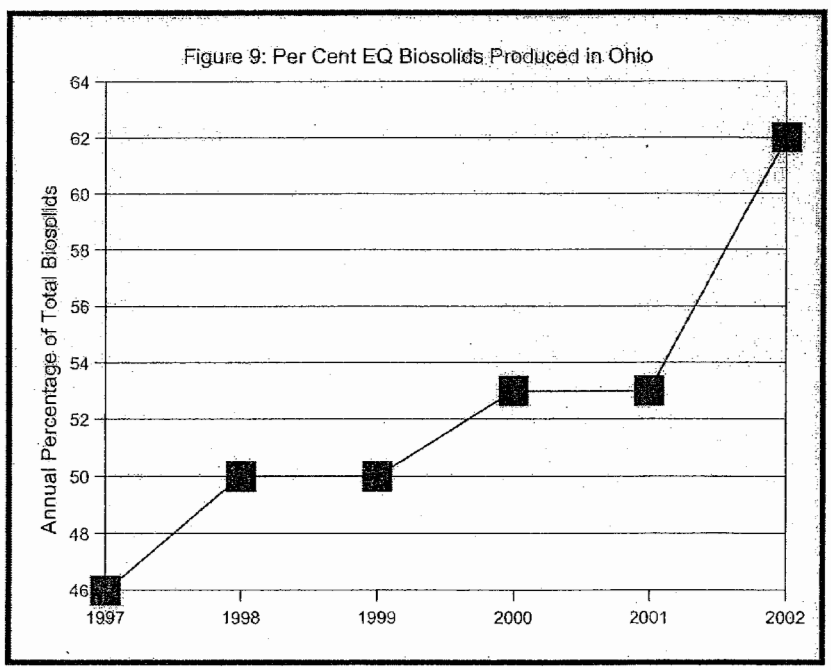
Sewage sludge destined for land application must meet strict treatment criteria of Title 40 of the Code of Federal Regulations, Part 503 (the same treatment criteria are found in Chapter 3745-40 of the Ohio Administrative Code). After such treatment, sewage sludge is commonly called biosolids. To be considered biosolids, sewage sludge must have low levels of heavy metal pollutants, be treated to reduce pathogen numbers, and meet criteria for vector attraction reduction. There has been a steady upward trend in dry tons of biosolids produced in Ohio since calendar year 1995, as shown in Figure 7.



The per cent that biosolids for land application comprises of the total sewage sludge generated annually in Ohio is shown in Figure 8. This value appears to be leveling off at sixty per cent, plus or minus. This relates back to the incineration of sewage sludge that occurs in many of Ohio's densely populated urban areas. Any significant change in per cent biosolids produced will probably be due to future changes in incineration practices.



Of interest is the relative dry tons of biosolids for land application treated to a Class A pathogen requirement (see Figure 9). In calendar year 2002, sixty-two per cent of the biosolids for land application produced in Ohio met Class A, and also Exceptional Quality criteria. Exceptional Quality means the biosolids were treated with a Class A pathogen reduction option, met one of vector attraction reduction options one through eight, and had heavy metal loadings below the monthly average limits. The Class A pathogen reduction treatment options reduce pathogen numbers to below detection limits. Class A biosolids are approved for general distribution and marketing as a result of verified pathogen reduction.

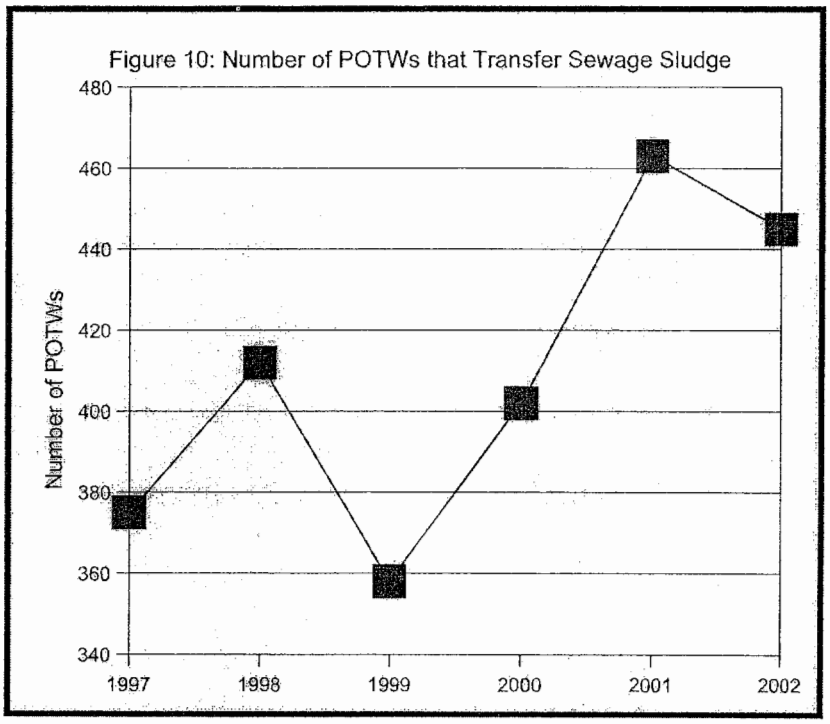


Class B pathogen reduction is not as rigorous, but the potential of human contact with Class B biosolids is greatly reduced. Class B biosolids are approved for use only in places where there is a low probability of human exposure.

Trend in Regionalization of Sewage Sludge Use or Disposal Management Efforts

Many Ohio POTWs realize that the creation of regional sewage sludge treatment facilities can help offset higher costs of sewage sludge use or disposal by spreading those costs over a larger population of shareholders. Regionalization can also provide benefits from an environmental standpoint. Replacement of many smaller treatment operations with a few large operations, some producing Exceptional Quality biosolids, helps to promote the beneficial reuse of sewage sludge and improves the quality of biosolids that are introduced to the environment. Regionalization can be beneficial from a regulatory perspective in that technical and compliance assistance resources are more efficiently utilized on a few larger facilities than on many smaller ones.

Figure 10 illustrates the quantity of sewage sludge transferred from one facility to another for further treatment or disposal. A total of 445 POTWs transferred the sewage sludge they generated in calendar year 2002 to another POTW.



Ohio EPA, Division of Surface Water, Sewage Sludge Management Program Update

Many changes occurred in the sewage sludge management program in 2002.

The sewage sludge management program hired new staff at the end of 2002. Two field coordinators will perform most of the field, and office, sewage sludge management duties of the Ohio EPA. Megan Carr is located in the NWDO and will have primary responsibility for NWDO and NEDO sewage sludge management. Contact information for Megan Carr is (419) 373-3003 or megan.carr@epa.state.oh.us . Suzanne Matz is located in Central Office and will have primary responsibility for CDO, SEDO, and SWDO sewage sludge management. Contact information for Suzanne Matz is (614) 644-2034 or suzanne.matz@epa.state.oh.us . Two college interns were hired in 2002 for the GIS project. The interns are delineating the land application sludge sites of Ohio in GIS.

Considerable activity took place in 2002 relating to Ohio EPA's efforts to receive 503 delegation from USEPA. Receipt of delegation would allow Ohio EPA to administer a 503 based sewage sludge management program. Ohio Administrative Code rules for the dis[posal, use, storage, or treatment of sewage sludge in Ohio were adopted by the Director on January 8, 2002. Those rules became effective on April 8, 2002. A Policy Manual, DSW Policy 0100.028 Ohio's Sewage Sludge Rules: Chapter 3745-40 of the Ohio Administrative Code, is avalable at the following website:

http://www.epa.state.oh.us/dsw/sludge/biosolid.html.

This policy manual contains the full text of the rules, information to provide clarification to the rules in a Frequently Asked Questions format, and other supporting information of Ohio's Sewage Slduge Management Program.

Ohio EPA Sewage Sludge Management Program goals for 2002 are to receive delegation from USEPA, develop NPDES permit standard language for the sewage sludge part of the permit, propose revisions to Ohio's sewage sludge management rules, and continue outreach to stakeholders as these changes proceed. The three major components of a delegation application submittal to USEPA are:

1. Program Description
2. Memorandum of Agreement between USEPA and the applicant
3. Certification that the applicant has the legal authority to run the program

Ohio EPA has submitted a Delegation Application Package to the Ohio Attorney General's Office for review. This is required by law. The review is expected to be favorable.

USEPA Sewage Sludge Program Update

The biggest biosolids news out of USEPA in calendar year 2002 is the decision to not add dioxin to the listof regulated pollutants in 40 CFR 503. Further information on the dicision

can be found on the following website:

http://www.epa.gov/OWM/mtb/biosolids/index.htm

Appendix: Ohio EPA District Offices

Southeast District Office
2195 Front Street
Logan, OH 43138
(800) 686-7330

Southwest District Office
401 East Fifth Street
Dayton, OH 45402-2911
(800) 686-8930

Northwest District Office
347 North Dunbridge Road
Bowling Green, OH 43402
(800) 686-6930

Northeast District Office
2110 East Aurora Road
Twinsburg, OH 44087
(800) 686-6330

Central District Office
3232 Alum Creek Drive
Columbus, OH 43207-3417
(800) 686-2330

Logan County Water Pollution Control District
Customer Base
in
Equivalent Dwelling Units

District 1 – Russells Point, Lakeview, Indian Isles, Orchard/Wolf
3,396 customers

District 2 – Chippewa through IL Shores, Five Parks, Waterbury, Moundwood, Indian Meadows,
2,661 customers

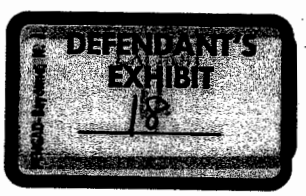
District 10 – Long Island, O'Connors, Blue Heron Cove
308 customers

District 502 North Fork **54 customer**
Belle Center **361 customers**

Commercial Customers **55 actual**

Debt Customers **47 – debt only no usage**

Total Customers 6,882



Russells Point, Ohio

-83.894268° (http://kvaleberg.com/extensions/mapsources/index.php?params=40.47021_N_-83.894268_E_type:city_region:US)
From Wikipedia, the free encyclopedia

Russells Point is a village located in the United States; within Logan County in the state of Ohio. The population was 1,619 at the 2000 census. It is situated on Indian Lake.

Geography

Russells Point is located at 40°28′13″N, 83°53′39″W (http://kvaleberg.com/extensions/mapsources/index.php?params=40_28_13_N_83_53_39_W_city) (40.470210, -83.894268)[GR1].

According to the United States Census Bureau, the village has a total area of 2.6 km² (1.0 mi²). 2.4 km² (0.9 mi²) of it is land and 0.2 km² (0.1 mi²) of it (7.84%) is water.

Demographics

Water tower of Russells Point.

As of the census[GR2] of 2000, there were 1,619 people, 727 households, and 415 families residing in the village. The population density was 672.1/km² (1,733.1/mi²). There were 1,081 housing units at an average density of 448.8/km² (1,157.2/mi²). The racial makeup of the village was 98.15% White, 0.12% African American, 0.19% Native American, 0.43% Asian, 0.49% from other races, and 0.62% from two or more races. Hispanic or Latino of any race were 1.42% of the population.

There were 727 households out of which 28.5% had children under the age of 18 living with them, 38.5% were married couples living together, 13.8% had a female householder with no husband present, and 42.8% were non-families. 37.7% of all households were made up of individuals and 17.3% had someone living alone who was 65 years of age or older. The average household size was 2.23 and the average family size was 2.91.

Main Street.

In the village the population was spread out with 26.7% under the age of 18, 8.2% from 18 to 24, 24.5% from 25 to 44, 24.3% from 45 to 64, and 16.4% who were 65 years of age or older. The median age was 36 years. For every 100 females there were 87.0 males. For every 100 females age 18 and over, there were 82.6 males.

The median income for a household in the village was $27,589, and the median income for a family was $37,434. Males had a median income of $35,326 versus $21,667 for females. The per capita income for the village was $15,835. About 17.7% of families

and 20.2% of the population were below the poverty line, including 26.3% of those under age 18 and 13.3% of those age 65 or over.


Indian Lake arch.

External links

- **Maps and aerial photos (http://kvaleberg.com/extensions/mapsources/index.php?params=40.47021_N_-83.894268_E_type:city_region:US)**
  - Wiki Satellite view at – WikiMapia (http://www.wikimapia.org/maps?ll=40.47021,-83.894268&spn=0.11,0.18&t=h)
  - Street map from Google Maps (http://maps.google.com/maps?ll=40.47021,-83.894268&spn=0.11,0.18), or Yahoo! Maps (http://maps.yahoo.com/maps_result?lat=40.47021&lon=-83.894268&mag=4), or Windows Live Local (http://local.live.com/default.aspx?cp=40.47021|-83.894268&style=r&lvl=13&v=1)
  - Satellite image from Google Maps (http://maps.google.com/maps?ll=40.47021,-83.894268&spn=0.11,0.18&t=h), Windows Live Local (http://local.live.com/default.aspx?cp=40.47021|-83.894268&style=h&lvl=13&v=1)
  - Topographic map from TopoZone (http://topozone.com/map.asp?lat=40.47021&lon=-83.894268&s=200&size=m&layer=DRG100&datum=nad83)
  - Aerial image or topographic map from TerraServer-USA (http://terraserver-usa.com/image.aspx?s=14&lon=-83.894268&lat=40.47021&w=2)

Retrieved from "http://en.wikipedia.org/wiki/Russells_Point%2C_Ohio"

Categories: Villages in Ohio | Logan County, Ohio

Lakeview, Ohio

3.922606° (http://kvaleberg.com/extensions/mapsources/index.php?params=40.485725_N_-83.922606_E_type:city_region:US)
From Wikipedia, the free encyclopedia

Lakeview is a village located in the United States; within Logan County in the state of Ohio. The population was 1,074 at the 2000 census.

Geography

Lakeview is located at 40°29′9″N, 83°55′21″W (http://kvaleberg.com/extensions/mapsources/index.php?params=40_29_9_N_83_55_21_W_city) (40.485725, -83.922606)[GR1].

According to the United States Census Bureau, the village has a total area of 1.8 km² (0.7 mi²), all land.

Lakeview takes its name from Indian Lake, a mostly artificial lake nearby. Part of the village's perimeter is bounded by the lakeshore.

Demographics

As of the census[GR2] of 2000, there were 1,074 people, 437 households, and 295 families residing in the village. The population density was 609.8/km² (1,570.2/mi²). There were 524 housing units at an average density of 297.5/km² (766.1/mi²). The racial makeup of the village was 97.30% White, 0.09% African American, 0.56% Native American, 0.28% Asian, 0.47% from other races, and 1.30% from two or more races. Hispanic or Latino of any race were 0.47% of the population.

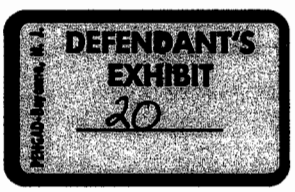
There were 437 households out of which 32.5% had children under the age of 18 living with them, 51.7% were married couples living together, 11.2% had a female householder with no husband present, and 32.3% were non-families. 27.9% of all households were made up of individuals and 12.1% had someone living alone who was 65 years of age or older. The average household size was 2.46 and the average family size was 2.97.

In the village the population was spread out with 27.5% under the age of 18, 7.4% from 18 to 24, 28.5% from 25 to 44, 20.6% from 45 to 64, and 16.1% who were 65 years of age or older. The median age was 36 years. For every 100 females there were 94.9 males. For every 100 females age 18 and over, there were 91.9 males.

The median income for a household in the village was $34,297, and the median income for a family was $40,714. Males had a median income of $35,000 versus $20,625 for females. The per capita income for the village was $16,148. About 6.8% of families and 10.9% of the population were below the poverty line, including 12.4% of those under age 18 and 12.7% of those age 65 or over.

External links

- **Maps and aerial photos (http://kvaleberg.com/extensions/mapsources/index.php?params=40.485725_N_-83.922606_E_type:city_region:US)**



- Wiki Satellite view at – WikiMapia (http://www.wikimapia.org/maps?ll=40.485725,-83.922606&spn=0.11,0.18&t=h)
- Street map from Google Maps (http://maps.google.com/maps?ll=40.485725,-83.922606&spn=0.11,0.18), or Yahoo! Maps (http://maps.yahoo.com/maps_result?lat=40.485725&lon=-83.922606&mag=4), or Windows Live Local (http://local.live.com/default.aspx?cp=40.485725|-83.922606&style=r&lvl=13&v=1)
- Satellite image from Google Maps (http://maps.google.com/maps?ll=40.485725,-83.922606&spn=0.11,0.18&t=h), Windows Live Local (http://local.live.com/default.aspx?cp=40.485725|-83.922606&style=h&lvl=13&v=1)
- Topographic map from TopoZone (http://topozone.com/map.asp?lat=40.485725&lon=-83.922606&s=200&size=m&layer=DRG100&datum=nad83)
- Aerial image or topographic map from TerraServer-USA (http://terraserver-usa.com/image.aspx?s=14&lon=-83.922606&lat=40.485725&w=2)

Retrieved from "http://en.wikipedia.org/wiki/Lakeview%2C_Ohio"

Categories: Villages in Ohio | Logan County, Ohio

Huntsville, Ohio

83.804725° (http://kvaleberg.com/extensions/mapsources/index.php?params=40.441284_N_-83.804725_E_type:city_region:US)
From Wikipedia, the free encyclopedia

For the place of this name located in Butler County in the US state of Ohio, see Huntsville, Butler County, Ohio.

Huntsville is a village located in the United States; within Logan County in the state of Ohio. The population was 454 at the 2000 census.

Geography

Huntsville is located at 40°26′29″N, 83°48′17″W

Aerial view of Huntsville

(http://kvaleberg.com/extensions/mapsources/index.php?params=40_26_29_N_83_48_17_W_city) (40.441284, -83.804725)[GR1].

According to the United States Census Bureau, the village has a total area of 0.9 km² (0.3 mi²), all land.

Demographics

As of the census[GR2] of 2000, there were 454 people, 175 households, and 134 families residing in the village. The population density was 515.6/km² (1,346.8/mi²). There were 185 housing units at an average density of 210.1/km² (548.8/mi²). The racial makeup of the village was 97.14% White, 0.22% African American, 0.44% Native American, 0.22% Asian, 0.44% from other races, and 1.54% from two or more races. Hispanic or Latino of any race were 0.66% of the population.

There were 175 households out of which 37.1% had children under the age of 18 living with them, 60.6% were married couples living together, 12.6% had a female householder with no husband present, and 22.9% were non-families. 17.7% of all households were made up of individuals and 6.9% had someone living alone who was 65 years of age or older. The average household size was 2.59 and the average family size was 2.93.

In the village the population was spread out with 26.9% under the age of 18, 7.0% from 18 to 24, 32.6% from 25 to 44, 20.3% from 45 to 64, and 13.2% who were 65 years of age or older. The median age was 34 years. For every 100 females there were 92.4 males. For every 100 females age 18 and over, there were 88.6 males.

The median income for a household in the village was $40,156, and the median income for a family was $44,306. Males had a median income of $33,333 versus $23,750 for females. The per capita income for the village was $15,928. About 3.6% of families and 8.4% of the population were below the poverty line, including 7.4% of those under age 18 and 14.6% of those age 65 or over.

External links

- **Maps and aerial photos (http://kvaleberg.com/extensions/mapsources/index.php?params=40.441284_N_-83.804725_E_type:city_region:US)**
  - Wiki Satellite view at – WikiMapia (http://www.wikimapia.org/maps?ll=40.441284,-83.804725&spn=0.11,0.18&t=h)
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Retrieved from "http://en.wikipedia.org/wiki/Huntsville%2C_Ohio"

Categories: Villages in Ohio | Logan County, Ohio

Stokes Township, Logan County, Ohio

From Wikipedia, the free encyclopedia

Stokes Township is one of seventeen townships in Logan County, Ohio. It is located in the northwestern corner of the county. The village of Lakeview lies within Stokes Township. The 2000 U.S. Census found 5,367 people in the township.

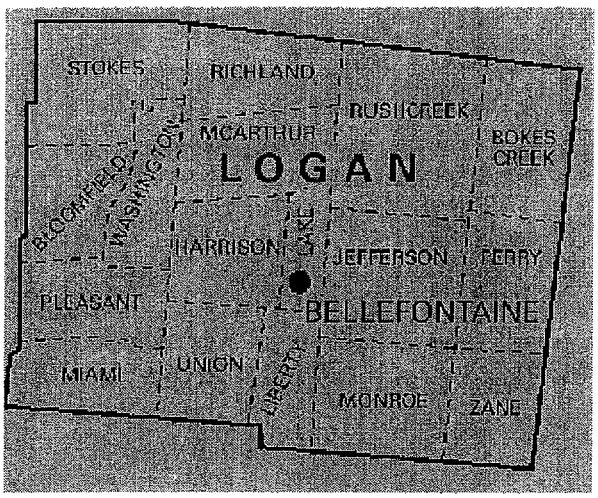
Contents

- 1 Geography
- 2 Name and history
- 3 Government
- 4 References
- 5 External links

Geography

It borders or touches the following other townships and municipalities:

- Bloomfield Township, on the south;
- Jackson Township, Shelby County, on the southwest;
- Clay Township, Auglaize County, on the west;
- Goshen Township, Auglaize County, on the north;
- Roundhead Township, Hardin County, on the northeast;
- Richland Township, on the east;
- Washington Township, on the southeast



Name and history

Stokes Township was formed in 1838 from Bloomfield Township.

Government

The township is governed by a three-member board of trustees, who are elected in November of odd-numbered years to a four-year term beginning on the following January 1. Two are elected in the year after the presidential election and one is elected in the year before it. There is also an elected township clerk, who serves a four-year term beginning on April 1 of the year after the election, which is held in November of the year before the presidential election. Vacancies in the clerkship or on the board of trustees are filled by the remaining trustees.

References

- Genealogy in Logan County, Ohio--Geography (http://www.rootsweb.com/~ohlogan/geog.html)
- County & Township Map of Ohio (http://www.dnr.state.oh.us/geosurvey/pdf/cotwpmap.pdf) (PDF object)
- The U.S. Census Bureau

External links

Categories: Logan County, Ohio | Townships in Ohio

Richland Township, Logan County, Ohio

From Wikipedia, the free encyclopedia

Richland Township is one of seventeen townships in Logan County, Ohio. It is located on the northern edge of the county. The village of Belle Center lies within Richland Township. The 2000 U.S. Census found 2,455 people in the township.

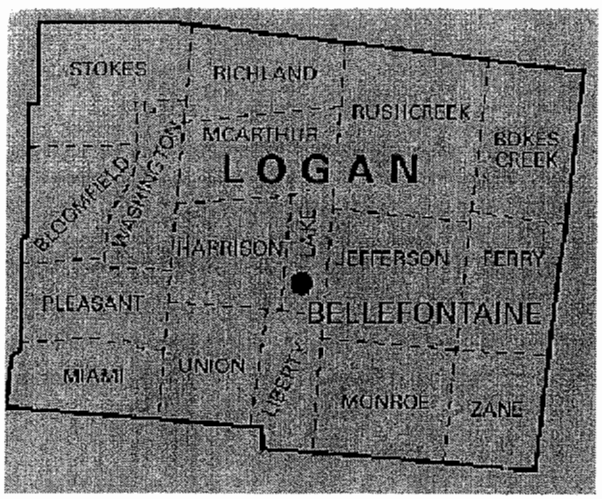
Contents

- 1 Geography
- 2 Name and history
- 3 Government
- 4 References
- 5 External links

Geography

It borders or touches the following other townships and municipalities:

- McArthur Township, on the south;
- Washington Township, on the southwest;
- Stokes Township, on the west;
- Roundhead Township, Hardin County, on the northwest;
- McDonald Township, Hardin County, on the north;
- Taylor Creek Township, Hardin County, on the northeast (touches, but does not border);
- Rushcreek Township, on the east



Points of interest:

- Indian Lake

Name and history

Richland Township was formed in 1844 from McArthur Township. It was the last township formed within Logan County.

Government

The township is governed by a three-member board of trustees, who are elected in November of odd-numbered years to a four-year term beginning on the following January 1. Two are elected in the year after the presidential election and one is elected in the year before it. There is also an elected township clerk, who serves a four-year term beginning on April 1 of the year after the election, which is held in November of the year before the presidential election. Vacancies in the clerkship or on the board of trustees are filled by the remaining trustees.

References

- Genealogy in Logan County, Ohio--Geography (http://www.rootsweb.com/~ohlogan/geog.html)
- County & Township Map of Ohio (http://www.dnr.state.oh.us/geosurvey/pdf/cotwpmap.pdf) (PDF object)
- The U.S. Census Bureau

External links

Retrieved from "http://en.wikipedia.org/wiki/Richland_Township%2C_Logan_County%2C_Ohio"

Categories: Logan County, Ohio | Townships in Ohio

Washington Township, Logan County, Ohio

From Wikipedia, the free encyclopedia

Washington Township is one of seventeen townships in Logan County, Ohio. It is located in the northwestern portion of the county. The village of Russells Point lies within Washington Township, as does the unincorporated community of Lewistown. The 2000 U.S. Census found 3,945 people in the township. Washington is the most popular township name in Ohio; 42 other state townships share the same name.

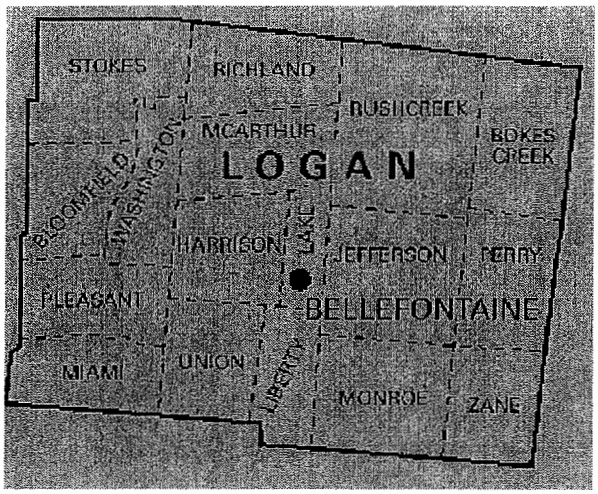
Contents

- 1 Geography
- 2 Name and history
- 3 Government
- 4 References
- 5 External links

Geography

It borders or touches the following other townships and municipalities:

- Pleasant Township, on the south;
- Bloomfield Township, on the west;
- Stokes Township, on the north;
- Richland Township, on the northeast;
- McArthur Township, on the east;
- Harrison Township, on the southeast



Points of interest within the township include:

- Indian Lake

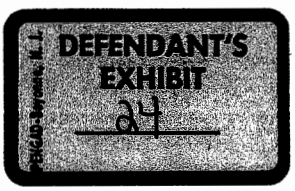
Name and history

Washington Township was formed in 1839 from Bloomfield Township.

Government

The township is governed by a three-member board of trustees, who are elected in November of odd-numbered years to a four-year term beginning on the following January 1. Two are elected in the year after the presidential election and one is elected in the year before it. There is also an elected township clerk, who serves a four-year term beginning on April 1 of the year after the election, which is held in November of the year before the presidential election. Vacancies in the clerkship or on the board of trustees are filled by the remaining trustees.

References



- Genealogy in Logan County, Ohio--Geography (http://www.rootsweb.com/~ohlogan/geog.html)
- County & Township Map of Ohio

(http://www.dnr.state.oh.us/geosurvey/pdf/cotwpmap.pdf) (PDF object)
- The U.S. Census Bureau

External links

Retrieved from "http://en.wikipedia.org/wiki/Washington_Township%2C_Logan_County%2C_Ohio"

Categories: Logan County, Ohio | Townships in Ohio | Common Ohio township names

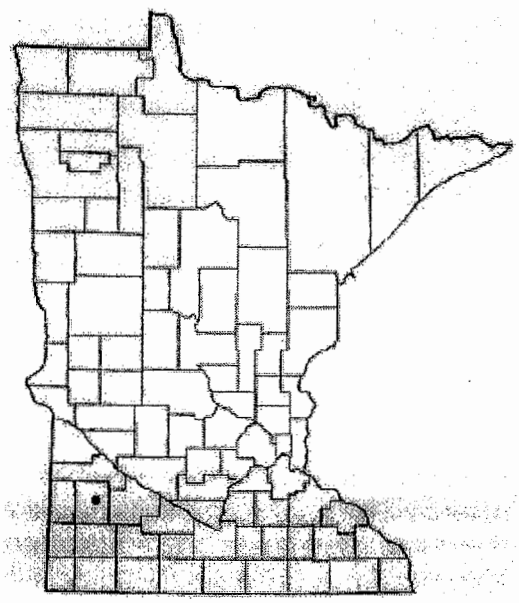
Marshall, Minnesota

From Wikipedia, the free encyclopedia

Marshall is a city in Lyon County, Minnesota, United States. The population was 12,735 at the 2000 census. It is the county seat of Lyon County[6]. Marshall is home to Southwest Minnesota State University.

Geography

According to the United States Census Bureau, the city has a total area of 21.5 km² (8.3 mi²), all land.



Demographics

As of the census[2] of 2000, there were 12,735 people, 4,914 households, and 2,914 families residing in the city. The population density was 593.1/km² (1,537.0/mi²). There were 5,182 housing units at an average density of 241.3/km² (625.4/mi²). The racial makeup of the city was 91.35% White, 2.79% African American, 0.35% Native American, 1.52% Asian, 0.03% Pacific Islander, 2.61% from other races, and 1.34% from two or more races. Hispanic or Latino of any race were 5.93% of the population.

There were 4,914 households out of which 30.5% had children under the age of 18 living with them, 48.0% were married couples living together, 8.6% had a female householder with no husband present, and 40.7% were non-families. 30.4% of all households were made up of individuals and 12.1% had someone living alone who was 65 years of age or older. The average household size was 2.39 and the average family size was 3.04.

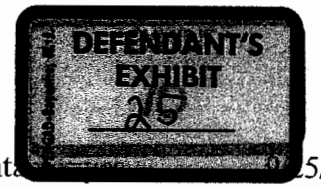
In the city the population was spread out with 23.9% under the age of 18, 19.1% from 18 to 24, 26.8% from 25 to 44, 17.7% from 45 to 64, and 12.4% who were 65 years of age or older. The median age was 30 years. For every 100 females there were 91.7 males. For every 100 females age 18 and over, there were 90.5 males.

The median income for a household in the city was $37,950, and the median income for a family was $52,284. Males had a median income of $35,478 versus $21,640 for females. The per capita income for the city was $18,588. About 7.8% of families and 12.4% of the population were below the poverty line, including 10.3% of those under age 18 and 16.7% of those age 65 or over.

Key Business(s)

The Schwan Food Company, headquartered in Marshall, is one of the largest, branded frozen-food companies in the United States and the second-largest privately-held corporation in Minnesota.

With approximately 22,000 employees worldwide, The Schwan Food Company has grown to become one of the largest producers of frozen pizza and egg rolls. The company is also a national leader in frozen dessert and premium ice cream manufacturing and distribution.

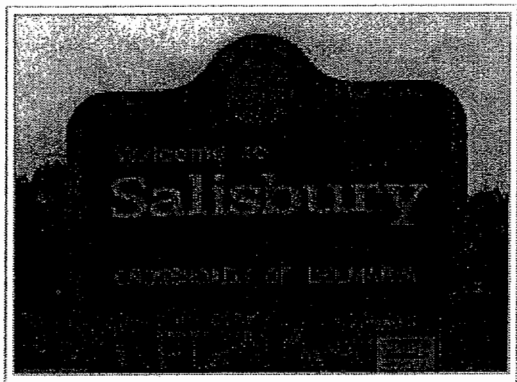


Categories: Cities in Minnesota | Lyon County, Minnesota

Salisbury, Maryland

75.593361° (http://kvaleberg.com/extensions/mapsources/index.php?params=38.365806_N_-75.593361_E_type:city_region:US)
From Wikipedia, the free encyclopedia

Salisbury



Salisbury - Crossroads of Delmarva.

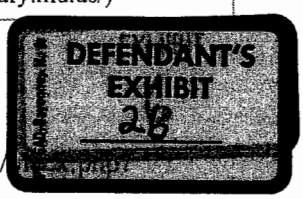
(pronounced 'Sallihzberry') is the county seat of Wicomico County, Maryland[GR6]. The population was 23,743 at the 2000 census. It is the principal of and is included in the Salisbury, Maryland Metropolitan Statistical Area, which is included in the Salisbury-Ocean Pines, Maryland Combined Statistical Area. The city it is the commercial hub of the Delmarva Peninsula and is sometimes called "the Crossroads of Delmarva." Salisbury University is located there, as is the Wicomico Youth and Civic Center. The city is a sister city of Salisbury, Witlshire, England.

The city is served by daily scheduled commercial airline service at the Wicomico Regional Airport. And on the Wicomico River, it has the second largest commerical port in Maryland.

Contents

- 1 Geography
- 2 Demographics
- 3 Notable People from Salisbury
- 4 Colleges and universities
- 5 Points of interest
- 6 Baseball
- 7 Media
  - 7.1 Television
  - 7.2 Newspaper
- 8 External links

Salisbury, Maryland	
Seal	
Nickname: "*The Crossroads of Delmarva*"	
Location in Maryland	
Coordinates: 38°21′57″N, 75°35′36″W (http://kvaleberg.com/extensions/mapsources/index.php?params=38_21_57_N_75_35_36_W_type:city)	
County	Wicomico County
Founded	1732
Incorporated	1854
Mayor	Barrie Parsons Tilghman
Area	
- City	29.6 km² (11.4 sq mi)
- Land	28.7 km² (11.1 sq mi)
- Water	0.9 km² (0.4 sq mi) 3.15%
Population	
- City (2000)	23,743
- Density	828.1/km²
- Metro	116,247
Time zone	Eastern (UTC-5)
- Summer (DST)	Eastern (UTC-4)
Website: www.ci.salisbury.md.us (http://www.ci.salisbury.md.us/)	



Geography

Salisbury is located at 38°21′57″N, 75°35′36″W (http://kvaleberg.com/extensions/mapsources/index.php?params=38_21_57_N_75_35_36_W_city) (38.365806, -75.593361)[GR1].

According to the United States Census Bureau, the city has a total area of 29.6 km² (11.4 mi²). 28.7 km² (11.1 mi²) of it is land and 0.9 km² (0.4 mi²) of it (3.15%) is water.

Demographics

As of the census[GR2] of 2000, there were 23,743 people, 9,061 households, and 4,802 families residing in the city. The population density was 828.1/km² (2,145.5/mi²). There were 9,612 housing units at an average density of 335.2/km² (868.6/mi²). The racial makeup of the city was 60.71% White, 32.32% African American, 0.23% Native American, 3.19% Asian, 0.03% Pacific Islander, 1.47% from other races, and 2.06% from two or more races. Hispanic or Latino of any race were 3.39% of the population.

There were 9,061 households out of which 27.4% had children under the age of 18 living with them, 30.4% were married couples living together, 18.2% had a female householder with no husband present, and 47.0% were non-families. 33.5% of all households were made up of individuals and 12.2% had someone living alone who was 65 years of age or older. The average household size was 2.36 and the average family size was 3.00.

In the city the population was spread out with 21.8% under the age of 18, 21.8% from 18 to 24, 26.9% from 25 to 44, 17.0% from 45 to 64, and 12.5% who were 65 years of age or older. The median age was 29 years. For every 100 females there were 87.2 males. For every 100 females age 18 and over, there were 82.9 males.

The median income for a household in the city was $29,191, and the median income for a family was $35,527. Males had a median income of $26,829 versus $21,920 for females. The per capita income for the city was $15,228. About 16.5% of families and 23.8% of the population were below the poverty line, including 28.9% of those under age 18 and 10.2% of those age 65 or over.

Notable People from Salisbury

- James Cannon Jr., bishop for the Methodist Episcopal Church, born in Salisbury November 13, 1864.
- Actor Alexis Denisof
- Actor John Glover
- Actress Linda Hamilton
- William Humphreys Jackson, Congressman representing Maryland in United States House of Representatives, Maryland District 1 from 1901-1905 & 1907-1909. He was the father of U.S. Senator, William P. Jackson. Born in Salisbury October 15, 1839.
- William P. Jackson, U.S. Senator for Maryland, 1912-1914. Born in Salisbury on January 11, 1868.
- Businessman Frank Perdue
- State's Attorney Davis R. Ruark
- U.S. Senator Paul Sarbanes
- Weather Channel Meteorologist Mike Seidel
- Kevin Shaffer, NFL football player with the Cleveland Browns.
- Actress Jessica Lee Rose who gained fame through the online soap opera, lonelygirl15 broadcast on YouTube

Colleges and universities

- Salisbury University
- Wor-Wic Community College

Points of interest

- Salisbury University Arboretum
- Salisbury Zoo
- The Centre at Salisbury
- The Ward Museum
- Perdue Stadium

Baseball

Salisbury has a rich history of supporting baseball. The Eastern Shore Baseball League was headquarted there; two franchises -- the Salisbury Cardinals and the Salisbury Indians -- called the city home. Today, the Delmarva Shorebirds represent the town in the South Atlantic League. The Eastern Shore Baseball Hall of Fame is housed at the Shorebird's home stadium. The Shorebirds are a Single-A Affiliate of the Baltimore Orioles.

Media

Television

- WBOC Channel 16, DT 21.1 CBS
- FOX21 Delmarva DT 21.2 FOX
- WMDT Channel 47, DT 53.1 ABC
- WB3 Cable Channel 3 WB -- to become The CW Network in September, 2006
- WCPB Channel 28, DT 58.1 & 58.2 PBS -- additional subchannels 58.3-58.5
- PAC14 (http://www.pac14.org/) Public Access Channel 14 - Local Government & Public Interest (Comcast)

Newspaper

- *The Daily Times* (http://www.delmarvanow.com/news/index.html)

External links

- Salisbury City Website (http://www.ci.salisbury.md.us/)
- Salisbury Area Chamber of Commerce (http://www.salisburyarea.com/index.html)
- **Maps and aerial photos (http://kvaleberg.com/extensions/mapsources/index.php?params=38.365806_N_-75.593361_E_type:city_region:US)**
  - Wiki Satellite view at – WikiMapia (http://www.wikimapia.org/maps?ll=38.365806,-75.593361&spn=0.11,0.18&t=h)
  - Street map from Google Maps (http://maps.google.com/maps?ll=38.365806,-75.593361&spn=0.11,0.18), or Yahoo! Maps (http://maps.yahoo.com/maps_result?lat=38.365806&lon=-75.593361&mag=4), or Windows Live Local (http://local.live.com/default.aspx?cp=38.365806|-75.593361&style=r&lvl=13&v=1)
  - Satellite image from Google Maps (http://maps.google.com/maps?ll=38.365806,-75.593361&spn=0.11,0.18&t=h), Windows Live Local (http://local.live.com/default.aspx?cp=38.365806|-75.593361&style=h&lvl=13&v=1)
  - Topographic map from TopoZone (http://topozone.com/map.asp?lat=38.365806&lon=-75.593361&s=200&size=m&layer=DRG100&datum=nad83)
  - Aerial image or topographic map from TerraServer-USA (http://terraserver-usa.com/image.aspx?s=14&lon=-75.593361&lat=38.365806&w=2)

State of Maryland

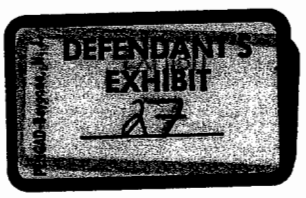
Topics	Cities | Government | History | U.S. Senators and Representatives
Capital	Annapolis
Regions	Western | Southern | Eastern Shore | Baltimore-Washington Metro Area | Chesapeake | Delaware Valley
Cities	Baltimore | Bethesda | Bowie | College Park | Columbia | Cumberland | Frederick | Gaithersburg | Germantown | Greenbelt | Hagerstown | Laurel | Rockville | **Salisbury** | Silver Spring | Takoma Park | Towson | Waldorf
Counties	Allegany | Anne Arundel | Baltimore City | Baltimore County | Calvert | Caroline | Carroll | Cecil | Charles | Dorchester | Frederick | Garrett | Harford | Howard | Kent | Montgomery | Prince George's | Queen Anne's | St. Mary's | Somerset | Talbot | Washington | Wicomico | Worcester

Retrieved from "http://en.wikipedia.org/wiki/Salisbury%2C_Maryland"

Categories: Cities in Maryland | Wicomico County, Maryland | Salisbury, Maryland | Port cities

034 ANTICIPATED FUNDS FOR APPROPRIATION FOR 2006 ACTUAL 2005 YEAR ENDING BALANCE

OPERATING REVENUE (034 ONLY)	$	1,509,405.00
NEW PERMITS	$	5,250.00
TRANSFERS	$	20,000.00
OTHER/ASSESSMENT RECEIPTS	$	5,000.00
SUBTOTAL	$	1,539,655.00
2006 TAX SETTLEMENT	$	145,000.00
2005 YEAR ENDING BALANCE	$	488,308.83
TOTAL FUNDS FOR APPROPRIATION	$	2,172,973.83
TOTAL APPROPRIATION FOR 2006	$	1,643,862.50
UNAPPROPRIATED BALANCE	$	529,111.33
ADDITIONAL APPRO. 02/03/06	- $	35,000.00
ADJUSTED UNAPPRO. BALANCE	$	494,111.33
NOTE LRP PHASE 1 ENG. 02/13/06	+ $	615,000.00
ADJUSTED APPRO. BALANCE	$	1,109,111.33
ADDITIONAL APPRO. 02/14/06	$	615,000.00
UNAPPRO. BALANCE	$	494,111.33
VOID 02/03/06 REQUEST	+ $	35,000.00



TOTAL UNAPPROPRIATED 06/15/06	$	529,111.33
ADDITIONAL APPRO. 06/15/06	- $	26,000.00
UNAPPROPRIATED BALANCE 06/15/06	$	503,111.33

INDIAN LAKE DISTRICT
FUND 034 ANNUAL
REVENUE/EXPENSE SUMMARY

REVENUES	2000	2001	2002	2003	2004	2005
OPERATING						
USER CHG	$1,323,780.30	$1,339,691.31	$1,345,793.65	$1,341,210.60	$1,365,161.96	$1,506,353.11
OTHER	$ 141,900.83	137,546.00	$ 140,274.86	$ 141,107.83	$ 158,184.26	$ 158,476.34
TOTAL OPER.	$1,465,681.13	$1,477,237.31	$1,486,068.51	$1,482,318.43	$1,523,346.22	$1,664,829.45
NON-OPER.						
PERMITS	$ 41,610.44	$ 54,619.07	$ 33,307.77	$ 38,480.56	$ 45,178.41	$ 38,273.31
TRANSFER	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 112,000.00	$ 0.00
OTHER	$ 16,463.05	$ 22,211.53	$ 14,130.92	$ 15,202.15	$ 56,791.23	$ 170,529.75
TOTAL NON-OP	$ 58,073.49	$ 76,830.60	$ 47,438.69	$ 53,682.71	$ 213,939.64	$ 208,803.06
TOTAL REV.	$1,523,754.62	$1,554,067.91	$1,533,507.20	$1,536,001.14	$1,737,315.86	$1,873,632.51
EXPENDITURES						
O& M	$ 687,353.65	$ 809,700.87	$ 900,675.88	$ 987,181.45	$1,046,662.67	$1,151,762.44
DEBT	$ 513,055.69	$ 535,372.46	$ 548,517.84	$ 386,423.96	$ 351,048.94	$ 407,620.81
R & R	$ 120,000.00	$ 50,000.00	$ 100,000.00	$ 120,000.00	$ 50,000.00	$ 40,000.00
CAP. IMP.	$ 684,288.56	$ 127,515.70	$ 105,995.95	$ 224,894.24	$ 193,921.34	$ 97,456.11
TOTAL EXP.	$2,004,702.90	$1,522,589.03	$1,655,189.67	$1,718,499.65	$1,641,632.95	$1,696,839.36
SUMMARY:						
BALANCE 1/1	$ 969,483.15	$ 488,534.87	$ 520,013.75	$ 398.331.28	$ 215,832.77	$ 311,515.68
REVENUE	$1,523,754.62	$1,554,067.91	$1,533,507.20	$1,536.001.14	$1,737,315.86	$1,873,632.51
TOTAL	$2,493,237.77	$2,042,6,053	$2,053,520.95	$1,934,332.42	$1,953,148.63	$2,185,148.19
EXP.	$2,004,702.90	$1,522,589.03	$1,655,189.67	$1,718,499.65	$1,641,632.95	$1,696,839.36
BALANCE 12/31	$ 488,534.87	$ 520,013.75	$ 398,331.28	$ 215,832.77	$ 311,515.68	$ 488,308.83

Fifth Third Securities, Inc.

August 15, 2006

Mr. Michael Yoder
Logan County Auditor
County Administration Building
100 South Madriver Street
Bellefontaine, Ohio 43311

Re: $4,850,000 Logan County, Ohio
Sewer System Improvement Notes, Series 2006B

Dear Mike:

For your records, this will serve as confirmation of our purchase of $4,850,000 Logan County, Ohio, Sewer System Improvement Notes, Series 2006B. The Notes bear an interest rate of 4.15%, are dated July 6, 2006 and shall mature April 4, 2007.

Due to a miscommunication in our office, the premium of $15,811.00 was sent to the County at the time of the closing/wire transfer. The County's wire should have been $4,850,000.00 instead of the $4,865,811.00 that was actually sent. In order for Fifth Third Securities to pay the costs of issuance (underwriting, bond counsel, paying agent, OMAC and CUSIP) from the Note premium, we need to have Logan County return $15,811.00 by check or wire to Fifth Third Securities. The check, written to Fifth Third Securities, should be sent to my attention in Columbus and I will see that it gets credited correctly and used for paying costs of issuance on the County Notes.

For your $4,850,000 Sewer System Improvement Notes, Series 2006B, the Paying Agent is Huntington National Bank. For the purposes of budgeting for 2007, the amount of interest due on the Note at maturity will be $149,838.06. On or prior to April 4, 2007, please wire principal ($4,850,000.00) and interest ($149,838.06) to Huntington National Bank per their instructions

We appreciate the opportunity to be of service to Logan County. If you have any questions, please call me at (614) 744-5346.

Sincerely,

Peter E. Ross

cc: Kacy Kirby, Clerk to the Commissioners
Dara Wren, County Treasurer
Garis Pugh, General Manager, Logan County Water Pollution Control

PER/EC

DEFENDANT'S EXHIBIT 28

Fifth Third Securities, Inc.

July 11, 2005

Mr. Michael Yoder
Logan County Auditor
County Administration Building
100 South Madriver Street
Bellefontaine, Ohio 43311

Re: $4,850,000 Logan County, Ohio
Sewer System Improvement Notes, Series 2005

Dear Mike:

For your records, this will serve as confirmation of our purchase of $4,850,000 Logan County, Ohio, Sewer System Improvement Notes, Series 2005. The Notes bear an interest rate of 4.00%, are dated July 7, 2005 and shall mature July 6, 2006. The interest rate included costs of issuance ($18,572.25) and net premium ($37,881.75) paid to the County. The net interest rate paid by the County is computed to be 3.17%.

The Paying Agent is Huntington National Bank. For the purposes of budgeting for 2006, the amount of interest due on the Note at maturity will be $193,461.11. On or prior to July 6, 2006, please wiire principal ($4,850,000.00) and interest ($193,461.11) to Huntington National Bank per their instructions

We appreciate the opportunity to be of service to Logan County. If you have any questions, please call me at (614) 744-5346.

Sincerely,

Peter E. Ross

PER/EC

cc: Kacy Sells, Clerk/Administrator
Dara Wren, Logan County Treasurer
Garis Pugh, General Manager, Logan County Water Pollution Control
Chris Franzmann, Squire, Sanders & Dempsey L.L.P.

MAY 1 6 2005

USDA Rural Development

United States Department of Agriculture
Rural Development
Columbus, Ohio

May 12, 2005

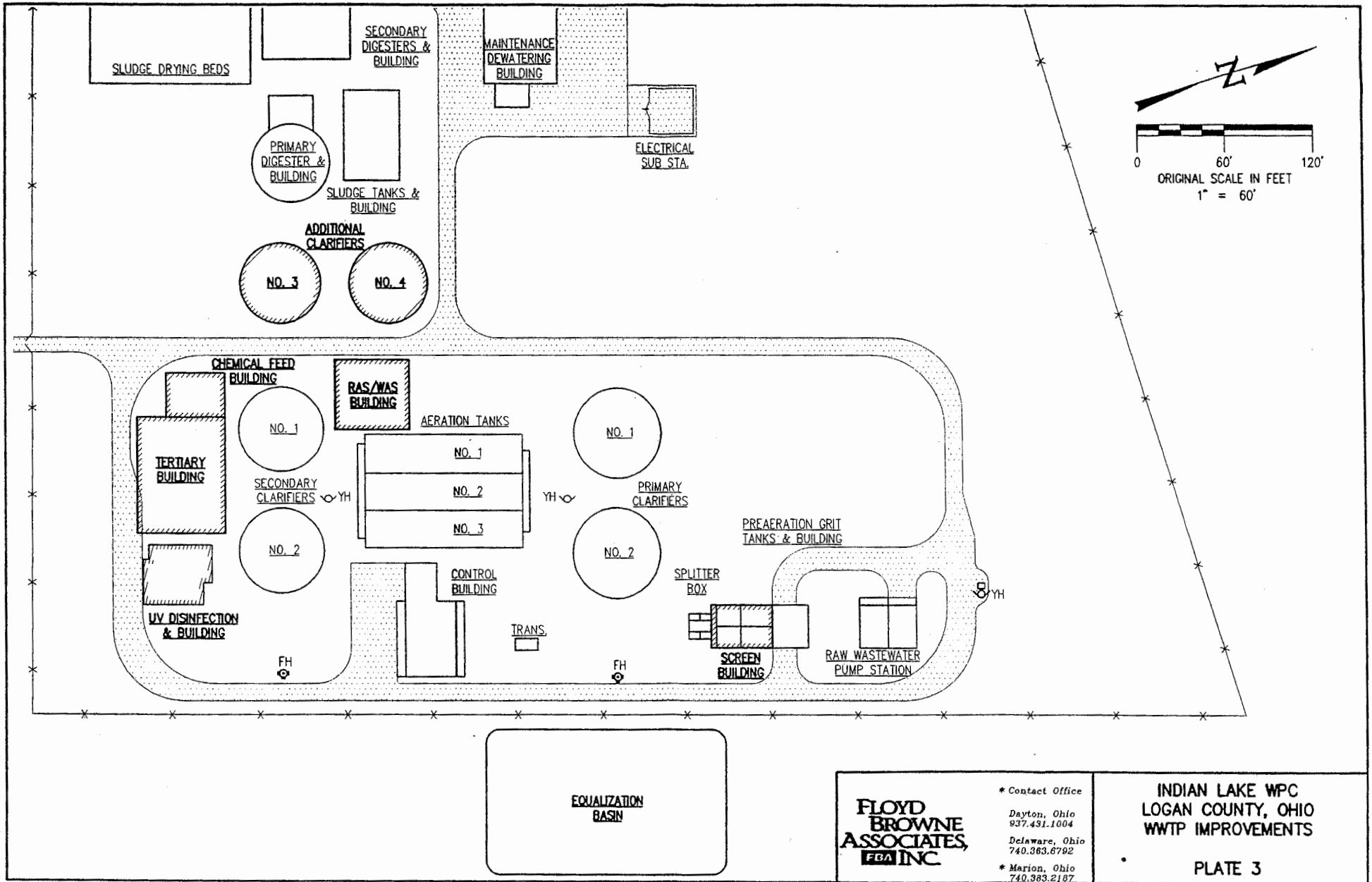
SUBJECT: Logan County
Huntsville/Cherokee Mans Area - Wastewater Project

TO: Lee Sonnenberg
Community Programs Specialist
Rural Development, Findlay, OH

Based upon the bid tabulations and the recommendations for award provided by Daniel Lindsay, P.E., Poggemeyer Design Group dated April 4, 2005 as well as the concurrence in these recommendations from the Logan County Commissioners dated April 19, 2005 and Gerald Heaton, Logan County Prosecutor, dated April 26, 2005 for the wastewater project, we anticipate the sources and uses of funds for the project will be as follows:

Sources	Rural Development Loan	1,892,000.00
	Additional Rural Development Loan	518,000.00
	Rural Development Grant	1,261,000.00
	Additional Rural Development Grant	170,000.00
	County Assessment (437 x $3500 per unit)	1,529,500.00
	County Connection Fee ($350 x 437 Users)	152,950.00
	County Contribution (Part of Contract A - Force Main)	672,000.00
	Additional County Contribution	355,550.00
	Total Sources	**$6,551,000.00**
Uses	Construction	$5,149,112.50
	"A" - Degen Excavating ($2,691,932.50)	
	"B" - Underground Utilities ($2,457,180.00)	
	Legal/Bond Counsel	65,000.00
	Land & Rights	100,000.00
	Engineering (Poggemeyer Design Group)	534,500.00
	Design/Contract Administration - $292,000.00	
	Resident Inspection - $156,000.00	
	Additional Services - $86,500.00	
	*Amendment #1	*7,200.00
	*Amendment #2	*10,000.00
	Testing/Misc.	20,500.00
	Interest	140,000.00
	Contingency (10%)	524,687.50
	Total Uses	**$6,551,000.00**

200 North High Street – Room 507, Columbus, OH 43215-2418
Phone: 614//255-2422 Fax: 614/255-2562 TDD: 614/255-2554
Committed to the future of rural communities



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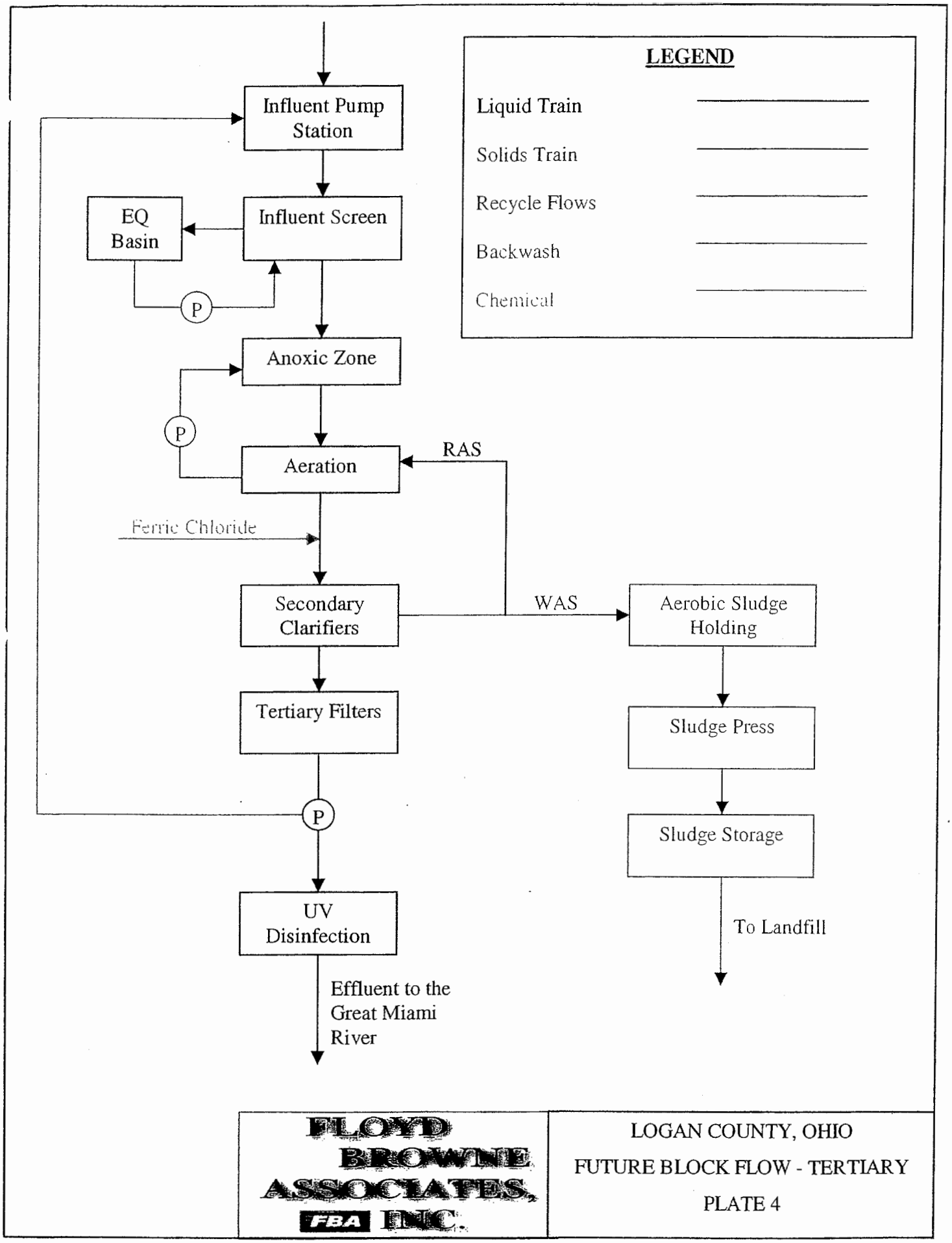
FLOYD BROWNE ASSOCIATES, INC FBA

* Contact Office
Dayton, Ohio
937.431.1004
Delaware, Ohio
740.363.6792
* Marion, Ohio
740.383.2187

INDIAN LAKE WPC
LOGAN COUNTY, OHIO
WWTP IMPROVEMENTS

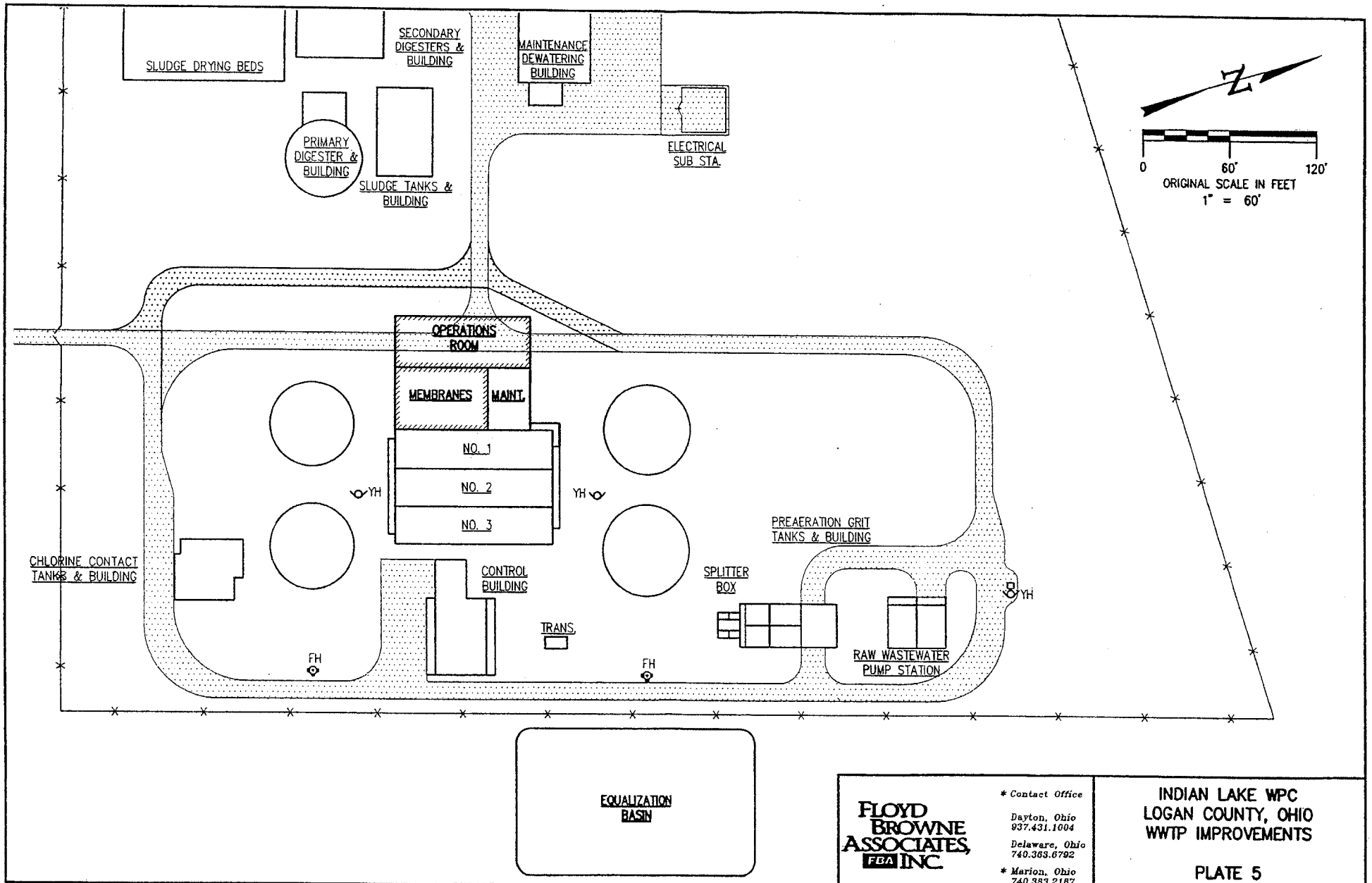
PLATE 3

FILE: 1211-62 MASTER PLAN\PLATE



FLOYD BROWNE ASSOCIATES, INC.

LOGAN COUNTY, OHIO
FUTURE BLOCK FLOW - TERTIARY
PLATE 4



FLOYD BROWNE ASSOCIATES, INC FBA

* Contact Office
Dayton, Ohio 937.431.1004
Delaware, Ohio 740.363.6792
* Marion, Ohio 740.383.2187

INDIAN LAKE WPC
LOGAN COUNTY, OHIO
WWTP IMPROVEMENTS

PLATE 5

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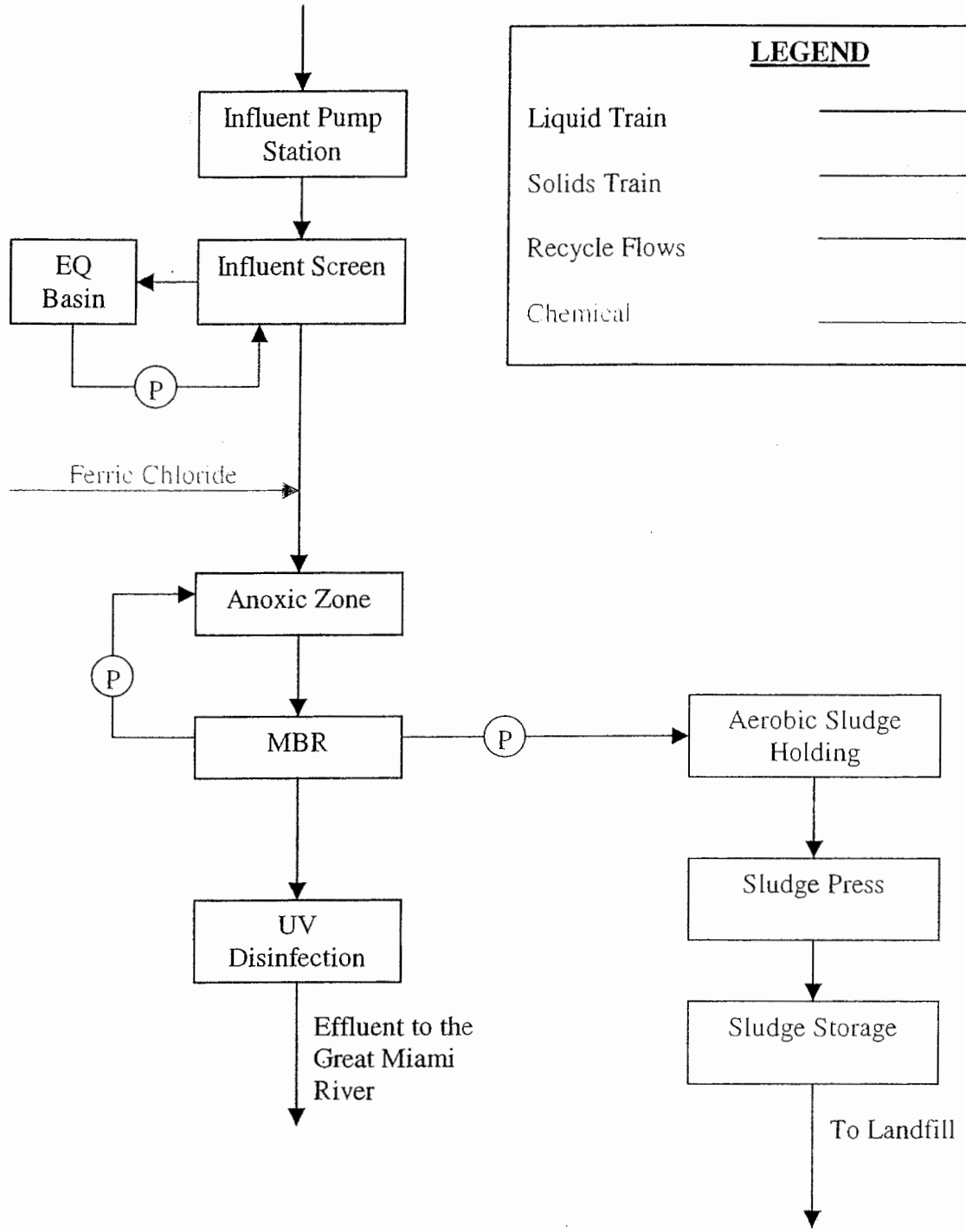


FLOYD BROWNE ASSOCIATES, INC.

LOGAN COUNTY, OHIO
FUTURE BLOCK FLOW - MBR
PLATE 6

April 1981
Revised August 1981
Revised January 1982

INDIAN LAKE
WASTEWATER TREATMENT PLANT
RUSSELLS POINT
LOGAN COUNTY, OHIO

BASIC DESIGN DATA

TREATMENT REQUIRED

NPDES Permit Number K602*AD (Expired June 30, 1977)

	30-Day Mean	7-Day Mean
BOD	8	12
SS	12	18
NH_3 (Summer)	1.0	1.5
(Winter)	2.5	5.0
Phosphorus	1.0	1.5
Coliform, per 100 ml	200	400
pH	Limits of 6.0 to 9.0	
Chorine Residual	Maximum of 0.5 mg/l	
Dissolved Oxygen	Minimum of 6.0 mg/l	

Note: The latest permit expired on June 30, 1977. EPA has committed funding for this project with phosphorus removal and rapid sand filter tertiary treatment deleted from the design. It is assumed that the future permit limitations will be changed to reflect a secondary treated effluent with 30-day mean values between 20-30 mg/l BOD and SS and the phosphorus limitations will be dropped. The basic design data to follow is based on this assumption.

TREATMENT PROCESS

The treatment process consists of comminution, raw wastewater pumping, aerated grit removal, preaeration, primary clarification, single-stage activated sludge for nitrification, secondary clarification, and chlorination. Excess storm flow treatment consists of aerated grit removal, preaeration clarification, and chlorination. Polymer addition to aid secondary clarification. Sludge treatment consists of anaerobic digestion and mechanical dewatering.

DESIGN CRITERIA

Year		2000
	Winter	Summer
Population	7,500	20,000
Flows, mgd		
Average	2.3	2.2
Maximum	4.6	4.4
Peak[1]	8.3	8.3

[1] Peak storm flows in excess of the maximum design flow will receive comminution, aerated grit removal, preaeration clarification, and chlorination treatment only.

Influent Loadings and Per Cent Removals

	BOD		SS		NH_3-N	
	Winter	Summer	Winter	Summer	Winter	Summer
Raw, mg/l	70	185	70	185	13	10
, lbs/day	1,275	3,400	1,275	3,400	250	330
% Removal, Primary	35	35	60	60	-	10
% Removal, Secondary	85	85	70	70	92	92
% Removal, Overall	90	90	88	88	92	93
Effluent, mg/l	7	18	8	22	1.0	1.3
, lbs/day	134	330	153	404	19	17

TREATMENT

Comminutors

Number	2
Capacity, Each, mgd, Average	2.1 to 4.6
Capacity, Each, mgd, Peak	7.5

Raw Wastewater Pumps

Number	4
Capacity, Each, gpm	2,100
Hp, Each	40
Type of Drive	2 - Variable Speed 2 - Constant Speed

Aerated Grit Removal

Number	2
Size	13 ft W x 20 ft L x 9 ft-8 in AWD
Volume, Total, cf	5,025
Detention Time, Minutes @ 2.3 mgd	23
Air Supply Required, scfm, Total @ 5 scfm/ft of length	200

Note: Grit removal by screw conveyor, bucket elevator, and washer.

Preaeration

Number	2
Size	13 ft W x 20 ft L x 9 ft-8 in AWD
Volume, Total, cf	5,025
Detention Time, Minutes @ 2.3 mgd	23
Air Required, scfm, Total @ 5 scfm/ft of length	200

Aerated Grit - Preaeration Blowers

Number	2
Hp, Each	20
Capacity, Each, scfm	500*

*60 scfm provided for aeration tank influent channel mixing.

TREATMENT (Continued)

Primary Clarifiers

Number	2
Dimensions, Each	60 ft dia x 12 ft SWD
Surface Area, Total, sf	5,650
Overflow Rate, gpd/sf @ 2.3 mgd	410
@ 8.3 mgd	1,470
Volume, Total, cf	67,800
Detention Time, hrs @ 2.3 mgd	1.5
8.3 mgd	5.3
Weir Length, Total, ft	580
Weir Plate, gpd/ft @ 8.3 mgd	14,310

Aeration Tanks

Number	3
Dimensions, Each	25 ft W x 110 ft L x 15 ft SWD
Volume, Total, cf	123,750
Detention Time, hrs @ 2.3 mgd	9.6
Summer Loadings, lbs/day, Average	
BOD	2,300
NH_3-N	330
Volumetric Loadings, lbs/day/1,000 cf	
BOD	18.8
NH_3-N	2.7
Peak TKN Loading, lbs/day	845
Oxygen Required, lbs/day, Peak	
BOD: 2,300 x 1.5 lbs O_2/lbs BOD = 3,450	
TKN: 845 x 4.6 lbs O_2/lbs TKN = 3,890	
	7,340
Air Required, Total, peak	2,400

Blowers

Number	3
Hp, Each	100
Capacity, Each, scfm	1,250

TREATMENT (Continued)

Secondary Clarifiers

Number	2
Dimensions, Each	55 ft dia x 14 ft SWD
Effective Surface Area, Total, cf	4,120
Overflow Rate, gpd/sf @ 2.3 mgd	560
@ 4.6 mgd	1,165
Volume, Total, cf	66,500
Detention Time, hrs @ 2.3 mgd	5.2
Weir Length, ft	520
Weir Rate, gpd/ft @ 4.6 mgd	8,850

Chlorination

Contact Tanks	
Number	2
Dimensions, Each	19 ft W x 34 ft-8 in L x 8 ft SWD
Volume, Total, cf	10,540
Detention Time, minutes @ 8.3 mgd	13*
Chlorine Requirements, lbs/day	
@ 1.0 mgd, 4 mg/l	35
@ 2.3 mgd, 4 mg/l	80
@ 4.6 mgd, 8 mg/l	310
@ 8.3 mgd, 14 mg/l	970

*Approximately 1,100 ft of 36-in dia effluent discharge pipe from the chlorine contact tank to the Miami River provides an additional 10 minutes detention time at 8.3 mgd.

Chlorinators	
Number	3
Capacity, Each, lbs/day	2 @ 200 1 @ 1,000

Note: All three chlorinators to have the capacity of 2,000 lbs/day. Two chlorinators to have 200 lbs/day metering tubes to operate in the 20 to 200 lbs/day range. One chlorinator to have 1,000 lbs/day metering tube to operate in the 100 to 1,000 lbs/day range. Automatic start of

TREATMENT (Continued)

Chlorination (Continued)

high range chlorinator when raw wastewater flow reaches 5.0 mgd and stops when flow drops below 5.0 mgd. High range chlorinator will be flow paced off of secondary bypass meter.

Post Aeration

Use a rip rapped effluent channel to provide the 6 mg/l dissolved oxygen requirement.

Sludge Production

Primary, lbs/day	2,380
Secondary, lbs/day	1,430
Storm Water, lbs/day, Average	170
Total, lbs/day	3,990

Anaerobic Digestors

First Stage	
Number	1
Dimensions	50 ft dia x 20 ft SWD
Volume, cf	39,270
Volatile Solids Loading, lbs/day/1,000 cf @ 70% Volatile Solids	71
Total Sludge to Digester, gpd @ 5% Solids	9,570
Detention Time, days	30
Second Stage	
Number (Existing)	2
Dimensions	26.5 ft x 26 ft x 25 ft SWD
Volume, Total, cf	34,450
Sludge Storage, days	27

Digested Sludge Well

Number	4
Dimensions, Each	18 ft W x 22 ft L x 7 ft-3 in AWD
Volume, Total, cf	11,485

TREATMENT (Continued)

Digester Sludge Well (Continued)

Note: Convert the two existing primary clarifiers for sludge well. Remove chain and flight sludge scraper equipment and effluent weir boxes. Install divider wall.

Sludge Dewatering (Belt Filter Press)

Dry Solids for Dewatering, lbs/hr (35 hrs/wk)	550
Number of Units	1

1. Size of belt filter press to be determined.
2. Sludge conditioning by polymer addition.
3. Sludge cake for landfill disposal will average 25% solids.

Stand-by Dewatering (Existing Sand Beds)

Number	6
Dimensions, Each	16.5 ft W x 100 ft L
Area, Total, sf	9,900
Loading, sf/capita, Summer	0.5
, Winter	1.3

Note: Additional stand-by to be provided by alternate disposal with liquid sludge hauling and land application.

Pumps

Number	Service	Capacity	Head	Rpm	Hp	
4	Raw Sewage	2100	45	1170	40	Constant Speed (2) Variable Speed (2)
3	RAS	1200	23	1170/880	10	Two-speed
2	Primary Sludge	200	33	1170	7½	"V" Belt Drive
2	Grease	200	33	1170	7½	"V" Belt Drive

Application No. OH0036641

Issue Date:

Effective Date:

Expiration Date: March 31, 2006

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

Logan County
Board of Commissioners

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Indian Lake Water Pollution Control District wastewater treatment works located at 1015 Orchard Island Road South, Russells Point, Ohio, Logan County and discharging to the Great Miami River in accordance with the conditions specified in Parts I, II, and III of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

_____
Christopher Jones
Director

Total Pages: 33

art I, A. - INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

. During the period beginning on the effective date of this permit and lasting until 24 months after the effective date of the permit, the ermittee is authorized to discharge in accordance with the following limitations and monitoring requirements from the following outfall: PK00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

able - Final Outfall - 001 - Interim

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
)010 - Water Temperature - C	-	-	-	-	-	-	-	1/Day	Continuous	All
)300 - Dissolved Oxygen - mg/l	-	5.0	-	-	-	-	-	1/Day	Multiple Grab	All
)515 - Residue, Total Dissolved - mg/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)530 - Total Suspended Solids - mg/l	-	-	45.0	30.0	-	783.0	522.0	3/Week	Composite	Winter
)530 - Total Suspended Solids - mg/l	-	-	30.0	20.0	-	522.0	348.0	3/Week	Composite	Summer
)552 - Oil and Grease, Hexane Extr ethod - mg/l	10.0	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
)610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	2.25	1.5	-	39.0	26.0	3/Week	Composite	Summer
)610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	12.75	8.5	-	222.0	148.0	3/Week	Composite	Winter
)630 - Nitrite Plus Nitrate, Total - mg/l	-	-	-	-	-	-	-	1/Month	Composite	All
)665 - Phosphorus, Total (P) - mg/l	-	-	-	-	-	-	-	1/Week	Composite	All
074 - Nickel, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
094 - Zinc, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
113 - Cadmium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
114 - Lead, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
118 - Chromium, Total Recoverable - /l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
119 - Copper, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	Composite	All
220 - Chromium, Dissolved Hexavalent - /l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly
616 - Fecal Coliform - #/100 ml	-	-	2000	1000	-	-	-	3/Week	Grab	Summer

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring	Sampling	Monitoring
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Frequency	Type	Months
9340 - Gamma-BHC, Total - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
9380 - Dieldrin, Whole Sample - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
0050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Continuous	All
0060 - Chlorine, Total Residual - mg/l	0.025	-	-	-	-	-	-	1/Day	Multiple Grab	Summer
0092 - Mercury, Total (Low Level) - ng/l	1600	-	-	26	0.028	-	0.0005	1/Month	Grab	All
1425 - Acute Toxicity, Ceriodaphnia lubia - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1426 - Chronic Toxicity, Ceriodaphnia lubia - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1427 - Acute Toxicity, Pimephales romelas - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1428 - Chronic Toxicity, Pimephales romelas - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
1941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1/Day	Multiple Grab	All
1942 - pH, Minimum - S.U.	-	6.5	-	-	-	-	-	1/Day	Multiple Grab	All
0082 - CBOD 5 day - mg/l	-	-	40.0	25.0	-	653.0	435.0	3/Week	Composite	Winter
0082 - CBOD 5 day - mg/l	-	-	23.0	15.0	-	391.0	261.0	3/Week	Composite	Summer

Notes for station 1PK00002001:

Effluent loadings based on average design flow of 4.6 MGD.
Total residual chlorine - See Part II, Item I.
Copper and Mercury - See Part I, C - Schedule of Compliance.
Mercury - See Part I, C and Part II, Item E.
pH - Critical values of minimum and maximum shall be reported daily.
Water Temperature - Report maximum temperature daily.
For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning 24 months after the effective date of the permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from the following outfall: 1PK00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1/Day	Continuous	All
00300 - Dissolved Oxygen - mg/l	-	5.0	-	-	-	-	-	1/Day	Multiple Grab	All
00515 - Residue, Total Dissolved - mg/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
00530 - Total Suspended Solids - mg/l	-	-	45.0	30.0	-	783.0	522.0	3/Week	Composite	Winter
00530 - Total Suspended Solids - mg/l	-	-	30.0	20.0	-	522.0	348.0	3/Week	Composite	Summer
00552 - Oil and Grease, Hexane Extr Method - mg/l	10.0	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	12.75	8.5	-	222.0	148.0	3/Week	Composite	Winter
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	2.25	1.5	-	39.0	26.0	3/Week	Composite	Summer
00630 - Nitrite Plus Nitrate, Total - mg/l	-	-	-	-	-	-	-	1/Month	Composite	All
00665 - Phosphorus, Total (P) - mg/l	-	-	-	-	-	-	-	1/Week	Composite	All
01074 - Nickel, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01094 - Zinc, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01113 - Cadmium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01114 - Lead, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01118 - Chromium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
01119 - Copper, Total Recoverable - ug/l	62.0	-	-	41.0	1.08	-	0.71	1/Month	Composite	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly
31616 - Fecal Coliform - #/100 ml	-	-	2000	1000	-	-	-	3/Week	Grab	Summer

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
39340 - Gamma-BHC, Total - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
39380 - Dieldrin, Whole Sample - ug/l	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Continuous	All
50060 - Chlorine, Total Residual - mg/l	0.025	-	-	-	-	-	-	1/Day	Multiple Grab	Summer
50092 - Mercury, Total (Low Level) - ng/l	1600	-	-	26	0.028	-	0.0005	1/Month	Grab	All
51425 - Acute Toxicity, Ceriodaphnia dubia - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
61426 - Chronic Toxicity, Ceriodaphnia dubia - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
51427 - Acute Toxicity, Pimephales promelas - TUa	-	-	-	-	-	-	-	1/Year	Composite	Yearly
51428 - Chronic Toxicity, Pimephales promelas - TUc	-	-	-	-	-	-	-	1/Year	Composite	Yearly
51941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1/Day	Multiple Grab	All
61942 - pH, Minimum - S.U.	-	6.5	-	-	-	-	-	1/Day	Multiple Grab	All
80082 - CBOD 5 day - mg/l	-	-	40.0	25.0	-	653.0	435.0	3/Week	Composite	Winter
80082 - CBOD 5 day - mg/l	-	-	23.0	15.0	-	391.0	261.0	3/Week	Composite	Summer

Notes for station 1PK00002001:

* Effluent loadings based on average design flow of 4.6 MGD.
- Total residual chlorine - See Part II, Item I.
- Mercury - See Part II, Item E and Part I,C. Schedule of Compliance.
- pH - Critical values of minimum and maximum shall be reported daily.
- Water Temperature - Report maximum temperature daily.
- For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

art I, B. - DOWNSTREAM-NEARFIELD MONITORING REQUIREMENTS

. Downstream-Nearfield Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, ıe permittee shall monitor the receiving stream, downstream of the point of discharge, at Station Number 1PK00002902, and report to the)hio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

'able - Downstream-Nearfield Monitoring - 902 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring	Sampling	Monitoring
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Frequency	Type	Months
1432 - 48-Hr. Acute Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
1435 - 96-Hr. Acute Toxicity Pimephales romela - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly

IOTES for Station Number 1PK00002902:

For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date f the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in ccordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly perating report form (Form 4500), including for the first three months after the effective date of the permit.

'art I, B. - DOWNSTREAM-FARFIELD MONITORING REQUIREMENTS

. Downstream-Farfield Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the ermittee shall monitor the receiving stream, downstream of the point of discharge, at Station Number 1PK00002903, and report to the Ohio PA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

'able - Downstream-Farfield Monitoring - 903 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
51438 - 7-Day Chronic Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
51441 - 7-Day Chronic Toxicity Pimephales promelas - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly

NOTES for Station Number 1PK00002903:

For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

Part I, B. - DOWNSTREAM-FARFIELD MONITORING REQUIREMENTS

1. Downstream-Farfield Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the receiving stream, downstream of the point of discharge, at Station Number 1PK00002901, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Downstream-Farfield Monitoring - 901 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1/Month	Grab	All
00300 - Dissolved Oxygen - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00400 - pH - S.U.	-	-	-	-	-	-	-	1/Month	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
31616 - Fecal Coliform - #/100 ml	-	-	-	-	-	-	-	1/Month	Grab	Summer

NOTES for Station Number 1PK00002901:

* Water temperature, dissolved oxygen, pH, and fecal coliform - See Part II, Item E.

'art I, B. - SLUDGE MONITORING REQUIREMENTS

. Sludge Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall ıonitor the treatment works' final sludge at Station Number 1PK00002581, and report to the Ohio EPA in accordance with the following ıble. See Part II, OTHER REQUIREMENTS, for location of sludge sampling.

'able - Sludge Monitoring - 581 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
)0400 - pH - S.U.	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly
)0611 - Ammonia (NH3) In Sludge - ng/kg	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)0627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)0668 - Phosphorus, Total In Sludge - ng/kg	-	-	-	-	-	-	-	1/Quarter	Composite	Quarterly
)1003 - Arsenic, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1028 - Cadmium, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1029 - Chromium, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1043 - Copper, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1052 - Lead, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1068 - Nickel, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1093 - Zinc, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
)1148 - Selenium, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
70316 - Sludge Weight - Dry Tons	-	-	-	-	-	-	-	1/Week	Total	All
70318 - Sludge Solids, Percent Total - %	-	-	-	-	-	-	-	1/Week	Grab	All
70322 - Sludge Solids, Percent Volatile - %	-	-	-	-	-	-	-	1/Week	Grab	All
71921 - Mercury, Total In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual
78465 - Molybdenum In Sludge - mg/kg	-	-	-	-	-	-	-	2/Year	Composite	Semi-annual

NOTES for Station Number 1PK00002581:

* Monitoring is required when sludge is removed from the wastewater treatment facility and disposed of by land application at agronomic rates. If no sludge is removed during the entire month, report "AL" in the first column of the first day of the month on the 4500 Form (Monthly Operating Report). If sludge is removed at least once during the month, report the appropriate values for sludge weight and sludge solids for the week(s) when sludge is removed; report "AH" for these parameters for weeks when sludge is not removed. A signature is still required.

Metal samples should be taken and reported in the months of June and December. If sludge is not hauled during June and December, then samples shall be taken and reported the next month that sludge is removed. At least two sets of samples for metal shall be taken and reported each year.

Nitrogen, pH, TKN, and phosphorus samples should be taken and reported in the months of March, June, September, and December. If sludge is not hauled during March, June, September, and December, then samples shall be taken and reported the next month that sludge is removed. At least four sets of samples for Nitrogen, pH, TKN, and phosphorus shall be taken and reported each year.

** Units of mg/kg are on a dry weight basis.

*** Sludge weight is a calculated total for the sampling period.

See Part II, Items K and N.

See Part I.C.3 - Schedule of Compliance.

Part I, B. - UPSTREAM MONITORING REQUIREMENTS

1. Upstream Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the receiving stream, upstream of the point of discharge at Station Number 1PK00002801, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Upstream Monitoring - 801 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1/Month	Grab	All
00300 - Dissolved Oxygen - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00400 - pH - S.U.	-	-	-	-	-	-	-	1/Month	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
31616 - Fecal Coliform - #/100 ml	-	-	-	-	-	-	-	1/Month	Grab	Summer
61432 - 48-Hr. Acute Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
61435 - 96-Hr. Acute Toxicity Pimephales promela - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
61438 - 7-Day Chronic Toxicity Ceriodaphnia dubia - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly
61441 - 7-Day Chronic Toxicity Pimephales promelas - % Affected	-	-	-	-	-	-	-	1/Year	Grab	Yearly

NOTES for Station Number 1PK00002801:

* Water temperature, dissolved oxygen, pH, ammonia-Nitrogen, and fecal coliform - See Part II, Item E.
· For toxicity testing, See Part II, Item O. An effluent biomonitoring program must be initiated within three months after the effective date of the permit. Sampling for acute and chronic toxicity must be initiated after submittal of the Standard Operating Procedures required in accordance with Part II, Item O. For months when sampling for toxicity is not required, report "AH" for these parameters in the monthly operating report form (Form 4500), including for the first three months after the effective date of the permit.

Part I, B. - INFLUENT MONITORING REQUIREMENTS

1. Influent Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the treatment works' influent wastewater at Station Number 1PK00002601, and report to the Ohio EPA in accordance with the following table. Samples of influent used for determination of net values or percent removal must be taken the same day as those samples of effluent used for that determination. See Part II, OTHER REQUIREMENTS, for location of influent sampling.

Table - Influent Monitoring - 601 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00530 - Total Suspended Solids - mg/l	-	-	-	-	-	-	-	3/Week	Composite	All
01941 - pH, Maximum - S.U.	-	-	-	-	-	-	-	1/Day	Multiple Grab	All
01942 - pH, Minimum - S.U.	-	-	-	-	-	-	-	1/Day	Multiple Grab	All
00082 - CBOD 5 day - mg/l	-	-	-	-	-	-	-	3/Week	Composite	All

Part I, C - Schedule of Compliance

1. Municipal Copper Schedule

This entity shall take actions described below as expeditiously as practicable, but not later than the dates developed in accordance with the following schedule.

The permittee shall attain compliance with the final effluent limitations of the permit for copper as expeditiously as practicable, but not later than the dates developed in accordance with the following schedule:

A. Not later than four (4) months after the effective date of this permit, the permittee shall submit a report to the Ohio EPA, Southwest District Office, describing the measures to be taken to achieve compliance with final effluent limitations for copper at outfall 1PK00002001. (Event Code 34099)

This report shall contain details of a plan to locate, isolate, and eliminate sources of copper to the sanitary sewers. It shall also include a schedule of implementation of the plan that specifies a deadline for compliance with the final effluent limitations for copper at outfall 1PK00002001. This compliance deadline shall not be later than two years after the effective date of this permit. When acknowledged as adequate by Ohio EPA, Southwest District Office in writing, this schedule shall be incorporated by reference as part of this permit.

B. Not later than twenty-four (24) months after the effective date of this permit, the permittee shall attain compliance with the final effluent limitations for copper at outfall 1PK00002001. (Event Code 88899)

2. Municipal Mercury Schedule

A. The permittee shall use EPA Method 1631, Revision B, to determine compliance with mercury effluent limits. The method detection level (MDL) for Method 1631 is 0.2 ng/l. The quantification level is 1.0 ng/l. Because the quantification level for Method 1631, Revision B, is lower than the mercury effluent limits, it is possible to directly evaluate compliance with the limits.

B. During the period beginning on the effective of this permit and lasting until this permit is modified or renewed, an interim quantification level (QL) of 1.0 ug/l (1000 ng/l) shall apply to analytical results reported for mercury. Any analytical result reported less than the interim QL shall be considered to be in compliance with that limit.

C. After this permit is modified and lasting until the expiration date of this permit, a final quantification level of 1.0 ng/l shall apply to analytical results reported for mercury, and the permittee shall have achieved full compliance with the final effluent table for outfall 1PK00002001.

REPORTING:

All analytical results, even those below the QL shall be reported. Analytical results are to be reported as follows:

i. Results above the QL: Report the analytical result for mercury.

ii. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

iii. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

D. Based on an evaluation of mercury data for outfall 1PK00002001 collected using Method 1631, the permittee shall submit one of the following to Ohio EPA not later than 19 Months from the effective date of this permit. (88899)

i. A letter stating that it intends to comply with the water quality based effluent limits for mercury included in the NPDES permit. In this case, the permit will be modified to remove the interim quantification level for mercury; or

ii. If the permittee believes that it will be able to take actions leading to compliance with the water quality based effluent limits for mercury included in this NPDES permit, it may submit a request to modify the NPDES permit to include a schedule of compliance and an interim effluent limit for mercury; or

iii. If the permittee determines that compliance with the water quality based effluent limits for mercury included in this permit is not possible without the construction of expensive end-of-pipe controls, a variance from the mercury water quality standards is available under section D(10) of rule 3745-33-07. If the permittee determines it is eligible, it may submit an application for coverage under this mercury variance. Section D(10)(a) of rule 3745-33-07 includes information on eligibility for coverage and lists the information that must be included in the application; or

iv. If the permittee determines that compliance with the water quality based effluent limits for mercury included in this permit is not possible, and it is not eligible for coverage under the mercury variance available at section D(10) of rule 3745-33-07, it may submit an application for an individual variance from water quality standards. Section (D)(1-3) of rule 3745-33-07 provides information on the applicability and conditions of an individual variance. Section (D)(4) of the rule lists the information that must be included in the application.

E. This permit may be modified to include either interim limits and a schedule of compliance or new limits and conditions if a variance is issued.

F. Copies of the final guidance document for the mercury variance and individual variance are available to permittees on request from Ohio EPA, Central Office, Division of Surface Water, Permits Section.

G. Letters or applications submitted under this item of the Schedule of Compliance shall be sent to the Division of Surface Water at the Ohio EPA Southwest District Office.

3. Municipal Sludge Schedule

The permittee shall submit to the appropriate Ohio EPA district office a substantially approvable sludge management plan as soon as possible, but no later than six (6) months after the effective date of this permit. (Event Code 95499)

This plan shall describe in detail the method or methods the entity intends to employ for the disposal or reuse of the sewage sludge generated by the facility. This plan shall also include an outline of all past and present sludge disposal practices.

Part II, Other Requirements

A. The wastewater treatment works must be under supervision of a Class III State certified operator as required by rule 3745-7- 02 of the Ohio Administrative Code.

B. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
1PK00002001	Final effluent from wastewater treatment plant prior to discharge to the Great Miami River. (Lat: 40 N 27 ' 36 "; Long: 83 W 54 ' 00 ")
1PK00002601	Raw sewage influent.
1PK00002581	Land application of liquid sludge at agronomic rates.
1PK00002801	Upstream sampling of outfall 001 in the Great Miami River at U.S. Route 33.
1PK00002901	Downstream sampling of outfall 001 in the Great Miami River at State Roue 708.
1PK00002902	Near-field (see Section 2, Part E of the reporting and testing guidance for biomonitoring).
1PK00002903	Far-field (see Section 3, Part E of the reporting and testing guidance for biomonitoring).

C. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and Holidays). On those days, report "AN" on the monthly report form.

D. Composite samples shall be comprised of a series of grab samples collected over a 24-hour period and proportionate in volume to the sewage flow rate at the time of sampling. Such samples shall be collected at such times and locations, and in such a fashion, as to be representative of the facility's overall performance.

E. Grab samples shall be collected at such times and locations, and in such fashion, as to be representative of the facility's performance.

F. Multiple grab samples shall be comprised of at least three grab samples collected at intervals of at least three hours during the period that the plant is staffed on each day for sampling. Samples shall be collected at such times and locations, and in such fashion, as to be representative of the facility's overall performance. The critical value shall be reported.

G. Effluent disinfection is not directly required, however, the entity is required to meet all applicable discharge permit limits. If disinfection facilities exist, they shall be maintained in an operable condition. Any design of wastewater treatment facilities should provide for the capability to install disinfection if required at a future time. Disinfection may be required if future bacteriological studies or emergency conditions indicate the need.

H. The treatment works must obtain at least 85 percent removal of carbonaceous biochemical oxygen demand (five-day) and suspended solids (see Part III, Item 1).

I. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the 40 CFR 136 promulgated analytical procedure for those parameters. In accordance with the ORC Section 6111.13 and OAC Rule 3745-33-07(C), if a discharge limit is set below the OEPA QL, any analytical result reported less than the OEPA QL shall be considered to be in compliance with that limit. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

Parameter	PQL	ML
Chlorine, Total Residual	0.050 mg/l	--

J. This permit may be modified, or alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

K. As soon as possible, but no later than six months after the effective date of this permit, the permittee shall sample, test, and submit the results of a sludge analysis for dioxin/dibenzofurans. The analysis shall be conducted on a composite, representative sample. The sample shall be representative of sludge removed to final disposal. The sample shall be a composite of at least one grab sample taken on each day which sludge is removed for final disposal over a five day period. The dioxin/dibenzofuran analysis will include:

1. Concentrations of dioxins reported as total concentration for each class 4 through 8 (class concentrations) and for all 2,3,7,8-congeners for each class 4 through 8(2,3,7,8-congener concentrations)

2. Concentrations of dibenzofurans reported as total concentration for each class 4 through 8 (class concentrations) and for all 2,3,7,8-congeners for each class 4 through 8 (2,3,7,8-congener concentrations)

The analysis shall be conducted following the procedures for Method 8290 as outlined in the most current edition of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846.

The analysis results will be reported showing individual isomer concentrations, total class concentration and a calculation of the Total Toxic Equivalence (TTE). If any individual isomer concentrations are less than the detection limit, a value of one-half (1/2) the detection level for that isomer will be used in the calculation of the TTE.

A sample analysis reporting form is available in the "Land Application of Sludge Manual"; Ohio EPA; September 28, 1998; pages 51 - 53.

The analysis results shall be submitted to: Ohio EPA; Division of Surface Water; Agriculture, Sludge and PTI Unit; Lazarus Government Center; P.O. Box 1049; Columbus, Ohio, 43216-1049.

L. POTWs that accept hazardous wastes by truck, rail, or dedicated pipeline are considered to be hazardous waste treatment, storage, and disposal facilities (TSDFs) and are subject to regulation under the Resource Conservation and Recovery Act (RCRA). Under the "permit-by-rule" regulation found at 40 CFR 270.60(c), a POTW must:

1) comply with all conditions of its NPDES permit,
2) obtain a RCRA ID number and comply with certain manifest and reporting requirements under RCRA,
3) satisfy corrective action requirements, and
4) meet all federal, state, and local pretreatment requirements.

M. Final permit limitations based on preliminary or approved waste load allocations are subject to change based on modifications to or finalization of the allocation or report or changes to Water Quality Standards. Monitoring requirements and/or special conditions of this permit are subject to change based on regulatory or policy changes.

Permit Guidance 11 Final	National Pollutant Discharge Elimination System (NPDES); Monitoring and Reporting for Sewage Sludge	
	Statutory references: ORC 6111.01, 6111.03, 6111.04 Rule references: OAC 3745-33, 3745-40	Ohio EPA, Division of Surface Water Revision 0, April 15, 2005
This internal guidance does not affect requirements found in referenced rule or statute.		

Purpose
To provide guidance for drafting the sewage sludge parts of a new NPDES permit or when renewing an existing NPDES permit.

Background
Ohio NPDES permits have included 40 C.F.R. 503 compliant monitoring stations since 1993. Ohio adopted laws and rules for sewage sludge management in 2000 and 2002 respectively. Sewage sludge management was delegated to Ohio EPA as part of the NPDES permit program in 2005. The information in this guidance document is consistent with ORC Chapter 6111. and OAC Chapter 3745-40.

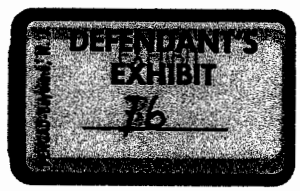
Procedure
Station tables, and the accompanying footnotes, outline the monitoring frequency requirements for sewage sludge disposal, use, storage, or treatment, by publicly owned treatment works and semi-public treatment works. Monitoring frequency requirements for sewage sludge stations are based on the dry weight of sewage sludge used or disposed in the most recent calendar year for which records are available. Monthly Operating Report (MOR) codes in **bold face** type are parameters that are required of any Permittee with such a sewage sludge station. Other parameters may be included on a case-by-case basis. On a case-by-case basis, monitoring may be necessary for parameters not listed in this guidance. In cases where additional monitoring is necessary, or when the proposed monitoring requirements are different from those of this guidance, the permit writer should document reasons for the changes. NPDES permit Part II and Part III guidance for sewage sludge is also provided in this document. Facsimile NPDES Part 1 stations are included as an appendix.

Industrial NPDES Permittee's may operate a domestic sewage package plant that is separate from the process wastewater collection and treatment system. If a permit writer is aware of such a situation, the industrial permit should have, at a minimum, a 586 station and/or a 588 station for the final disposal of sewage sludge removed from such treatment works.

Cross Reference
Permit Guidance 1 - National Pollutant Discharge Elimination System; Monitoring Frequency Requirements for Sanitary Discharges.

For More Information, Contact:

Ohio EPA, Division of Surface Water
Sewage Sludge Management Program
Chris Bowman (614) 644-2134 chris.bowman@epa.state.oh.us
Suzanne Matz (614) 644-2034 suzanne.matz@epa.state.oh.us



Station 581 - Monitoring requirements for land application of non-EQ sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Weight (B)	**US**	**70316**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Fee weight (C)	**US**	**51129**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Metals (D)	**mg/kg**	**varies**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Ammonia N	**mg/kg**	**00611**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Kjeldahl N	**mg/kg**	**00627**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
NO2/NO3 N (E)	mg/kg	00633	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Fecal coliform (F)	MPN/g	31641	2/Month T	1/Month T	1/Qtr T	2/Year T	1/Year T
Fecal coliform (F)	CFU/g	51131	2/Month T	1/Month T	1/Qtr T	2/Year T	1/Year T

Station 581 applies to land application of non-exceptional quality sewage sludge (the definition of "exceptional quality" is found in OAC rule 3745-40-01). Parameters in **bold** are required to be monitored by all Permittee's with a 581 station. Monitoring of other parameters, whether listed above or not, is at the discretion of the Director and depends in part on the treatment choices made by the Permittee. For example, if the Permittee utilizes class B pathogen reduction alternative 1 then one of the two Fecal coliform monitoring options must be chosen. The MPN/g option is recommended.

It is recommended that NPDES permits with a 581 station also include a 586 station and/or a 588 station as backup sewage sludge management alternatives.

Station 582 - Monitoring requirements for storage of sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)
			Any amount
Weight (B)	US tons	70316	1/Year T

Station 582 may be included in an NPDES permit at the discretion of the Director. The parameters to be included are at the discretion of the Director. The purpose of a station 582 is to ensure continued protection of public health and the environment when sewage sludge is stockpiled, stored in a field, or stored at the generating facility, and to provide the ability to track wastewater treatment plant operations over time.

Station 583 is reserved.

Station 584 - Monitoring requirements for land application of EQ sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Weight (B)	**US tons**	**70316**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Fee weight (C)	**US tons**	**51129**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Metals (D)	**mg/kg**	**varies**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Ammonia N	**mg/kg**	**00611**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
Kjeldahl N	**mg/kg**	**00627**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**
NO2/NO3 N (E)	mg/kg	00633	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Fecal coliform (G)	MPN/g	31641	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Salmonella sp. (G)	MPN/4g	71202	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Enteric virus (H)	PFU/4g	81401	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C
Helminth ova (I)	#/4g	51130	2/Month C	1/Month C	1/Qtr C	2/Year C	1/Year C

Station 584 applies to land application of exceptional quality sewage sludge (the definition of "exceptional quality sludge" is fund in OAC rule 3745-40-01). Parameters in **bold** are required to be monitored by all Permittee's with a 584 station. Monitoring of other parameters, whether listed above or not, is at the discretion of the Director. All Permittee's must choose to monitor either Fecal coliform or Salmonella sp. to demonstrate pathogen reduction. The permit writer must determine which option the Permittee wishes to utilize and insert the choice in the 584 table.

It is recommended that all Permittee's that generate an exceptional quality sewage sludge also have a 581 station, for non-exceptional quality sewage sludge, for the times when the sewage sludge may not meet "EQ" criteria but still can be land applied as a non-exceptional quality sewage sludge. Including a 586 and/or 588 station as further backup is recommended.

Station 585 - Monitoring requirements for incineration of sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Fee weight (C)	**US tons**	**51129**	**2/Month T**	**1/Month T**	**1/Qtr T**	**2/Year T**	**1/Year T**
Metals (J)	**mg/kg**	**varies**	**2/Month C**	**1/Month C**	**1/Qtr C**	**2/Year C**	**1/Year C**

Station 585 applies to incineration of sewage sludge. Parameters in **bold** are required to be monitored by all Permittee's with a 585 station. Monitoring of other parameters would be included at the discretion of the Director.

Station 586 - Monitoring requirements for disposal of sewage sludge in a landfill

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)
			Any amount
Fee weight (C)	**US tons**	**51129**	**1/Year T**

Station 586 applies to sewage sludge disposed in a landfill. Parameters in **bold** are required to be monitored by all Permittee's with a 586 station. Monitoring of other parameters, whether listed above or not, are included at the discretion of the Director. Permittee's with a 581 and/or 584 station are recommended to include a 586 station in their NPDES permit. The back-up ability to landfill sewage sludge is considered a prudent management practice.

Station 587 is reserved.

Station 588 - Monitoring requirements for transfer of sewage sludge to another NPDES permit holder

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)
			Any amount
Weight (B)	US tons	70316	1/Year T
Volume (K)	Gals	80991	1/Year T

Station 588 applies to sewage sludge transferred to another NPDES Permittee. Since OAC 3745-40 requires any person who disposes, uses, stores or treats sewage sludge to have an NPDES permit for the activity, sewage sludge should only be transferred to an NPDES permit holder whose permit allows for the disposal, use, storage, or treatment of sewage sludge. Permittee's with a 581 and/or 584 station are recommended to include a back-up 588 station in their NPDES permit. The annual total of sewage sludge transferred may be reported in dry tons, or gallons, at the discretion of the Director (gallons is often preferred especially for small treatment works that hire a waste hauler to remove relatively small volumes of sewage sludge).

Station 589 - Monitoring requirements for other disposal, use, storage, or treatment of sewage sludge

Parameter	Units (A)	MOR Code	Sewage sludge weight (U. S. dry tons per calendar year) (B)				
			≥16,500	≥1,650 but <16,500	≥320 but <1,650	≥70 but <320	<70
Weight (B)	US tons	70316	2/Month T	1/Month T	1/Qtr T	2/Year T	1/Year T

Station 589 should be used on a case-by-case basis, at the discretion of the Director, when sewage sludge disposal, use, storage, or treatment does not fit one of the other sewage sludge stations. The parameters to be included are at the discretion of the Director. Discharge limitations should reflect exceptional quality sewage sludge requirements or non-exceptional quality sewage sludge requirements, when applicable. Example: Some municipalities have been involved in a long term surface disposal project at the PPG Lime Lakes. Station 589 could be used to customize reporting requirements for the PPG Lime Lakes project.

Footnotes

C = composite, T = total

(A) All units are dry weight basis (except Volume in gallons).

(B) Weight means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming material or bulking agents. Sewage sludge monitoring frequency is based on the annual sewage sludge weight, in dry US tons, for the most recent calendar year per rule 3745-40-06 of the Ohio Administrative Code [Note: both Weight and Fee weight must be included as parameters for land application, incineration and landfill disposal sewage sludge stations. Ohio EPA must track Fee weight as per the ORC, and Weight for numerous reasons including Clean Water Act regulations (503)].

(C) Fee weight means the weight of sewage sludge, in dry U.S. tons, excluding any admixtures such as liming material or bulking agents. Annual sewage sludge fees are based on the most recent calendar year generation of sewage sludge per Section 3745.11(Y) of the Ohio Revised Code [Note: both Weight and Fee weight must be included as parameters for land application, incineration and landfill disposal sewage sludge stations. Ohio EPA must track Fee weight as per the ORC, and Weight for numerous reasons including Clean Water Act regulations (503)].

(D) The following metals shall be monitored when sewage sludge is applied to the land:
Arsenic, Total In Sludge - MOR code 01003
Cadmium, Total In Sludge - MOR code 01028
Copper, Total In Sludge - MOR code 01043
Lead, Total In sludge - MOR code 01052
Mercury, Total In Sludge - MOR code 71921
Molybdenum, Total In Sludge - MOR code 78465
Nickel, Total In Sludge - MOR code 01068
Selenium, Total In Sludge - MOR code 01148
Zinc, Total In Sludge - MOR code 01093

(E) Monitoring for nitrite/nitrate nitrogen is recommended for composted sewage sludge, aerobically digested sewage sludge, and air dried sewage sludge. These aerobic processes promote the nitrification of ammonia. Other sewage sludge treatment processes do not promote the nitrification of significant ammonia and monitoring for nitrite/nitrate nitrogen is not required.

(F) Monitoring for fecal coliform is required for class B pathogen reduction alternative 1. Seven separate composite samples of the sewage sludge, said samples recommended to be taken at two day intervals, shall be submitted for analysis using either the most probable number (MPN/g, MOR code 31641) method or the colony forming unit (CFU/g, MOR code 51131) method. The MPN/g method is recommended (further information on the methods of analysis, and the calculation of a geometric mean based on the analysis, is available in DSW Policy 0100.028). The number to be submitted on the MOR is the calculated total geometric mean of the seven representative samples.

(G) Monitoring for fecal coliform (or Salmonella sp. bacteria, see below) is required for all class A pathogen reduction alternatives. For fecal coliform the most probable number (MPN/g, MOR code 31641) is the required monitoring methodology.

Salmonella sp. monitoring (MPN/4g, MOR code 71202) may be substituted for the fecal coliform monitoring for class A pathogen reduction alternatives. This is not recommended. Fecal coliform (MPN/g, MOR code 31641) is the recommended pathogen reduction monitoring method.

(H) Monitoring sewage sludge for the presence of enteric virus is required for class A pathogen reduction alternative 3 and class A pathogen reduction alternative 4.

(I) Monitoring sewage sludge for the presence of viable helminth ova is required for class A pathogen reduction alternative 3 and class A pathogen reduction alternative 4.

(J) The following metals shall be monitored when sewage sludge is fired in an incinerator:
Arsenic, Total In Sludge - MOR code 01003
Beryllium, Total In Sludge - MOR code 01013
Cadmium, Total In Sludge - MOR code 01028
Chromium, Total In Sludge - MOR code 01029
Lead, Total In sludge - MOR code 01052
Mercury, Total In Sludge - MOR code 71921
Nickel, Total In Sludge - MOR code 01068

(K) At the discretion of the Director, Permittee's may report sewage sludge gallons transferred to another facility rather than sewage sludge dry tons transferred to another facility. Total cumulative gallons transferred shall be tracked and reported annually.

Guidance for Part II, Other Parameters

The following paragraphs should be included in Part II for all POTWs that generate a sewage sludge:

> "All disposal, use, storage, or treatment of sewage sludge by the Permittee shall comply with Chapter 6111. of the Ohio Revised Code, Chapter 3745-40 of the Ohio Administrative Code, any further requirements specified in this NPDES permit, and any other actions of the Director that pertain to the disposal, use, storage, or treatment of sewage sludge by the Permittee".
>
> "Sewage sludge composite samples shall consist of six to twelve grab samples collected at such times and locations, and in such fashion, as to be representative of the facilities sewage sludge".
>
> "No later than January 31 of each calendar year the Permittee shall submit two (2) copies of a report summarizing the sewage sludge disposal, use, storage, or treatment activities of the Permittee during the previous calendar year. One copy of the report shall be sent to the Ohio EPA, Division of Surface Water, P.O. Box 1049, Columbus, Ohio 43216-1049, and one copy of the report shall be sent to the appropriate Ohio EPA District Office. The report shall be submitted on Ohio EPA Form 4229".
>
> "Each day when sewage sludge is removed from the wastewater treatment plant for use or disposal a representative composite sample of sewage sludge shall be collected and monitored for total solids. Results of the monitoring shall be used to calculate the total Sewage Sludge Weight (Monthly Operating Report code 70316) and total Sewage Sludge Fee Weight (Monthly Operating Report code 51129) for the reporting period specified by this NPDES permit. The results of the daily monitoring, and the weight calculations, shall be maintained on site for a minimum of five years. The test methodology used shall be Part 2540 G of Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992. To convert from gallons of liquid sewage sludge to dry tons of sewage sludge: dry tons = gallons x 8.34 (lbs/gallon) x 0.0005 (tons/lb) x decimal fraction total solids".

The following information shall be included in Part II of each NPDES permit issued to a POTW that land applies class B pathogen reduction treated sewage sludge (below the "sampling station" information is suggested): a list of the counties in which the POTW proposes to land apply class B sewage sludge to authorized sites.

> "The Permittee may request authorization of land application sites in the following Ohio counties:
> County A
> County B
> etc."

The following paragraph should be included in Part II of each NPDES permit issued to a POTW that has an average daily final effluent flow of 100,000 gpd or greater, and that land applies sewage sludge (has a 581 and/or a 584 station).

> "A grab sample of sewage sludge that has been treated to meet requirements for application to the land shall be monitored for dioxin, as the term dioxin is defined in rule 3745-40-01 of the Ohio Administrative Code, as per the monitoring frequency, methodologies and reporting requirements described in rule 3745-40-06 of the Ohio Administrative Code".

Guidance for Part III, General Conditions

The following definitions appear in Part III of NPDES permits.

1. "Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works as defined in section 6111.01 of the Revised Code. "Sewage sludge" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.

2. "Sewage sludge weight" means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming materials or bulking agents. Monitoring frequencies for sewage sludge parameters are based on the reported sludge weight generated in a calendar year (use the most recent calendar year data when the NPDES permit is up for renewal).

3. "Sewage sludge fee weight" means the weight of sewage sludge, in dry U.S. tons, excluding admixtures such as liming materials or bulking agents. Annual sewage sludge fees, as per section 3745.11(Y) of the Ohio Revised Code, are based on the reported sludge fee weight for the most recent calendar year.

RECORDS RETENTION

The Permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years except those records that pertain to sewage sludge disposal, use, storage, or treatment, which shall be kept for a minimum of five years, including:

1. All sampling and analytical records (including internal sampling data not reported);
2. All original recordings for any continuous monitoring instrumentation;
3. All instrumentation, calibration and maintenance records;
4. All plant operation and maintenance records;
5. All reports required by this permit; and
6. Records of all data used to complete the application for this permit for a period of at least three years, or five years for sewage sludge, from the date of the sample, measurement, report, or application.

SOLIDS DISPOSAL

Collected grit and screenings, and other solids other than sewage sludge, shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state, and in accordance with all applicable laws and rules.

Appendix: The following tables are facsimiles of the default stations that will be available in SWIMS. Parameters may need to be added on a case-by-case basis.

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 581 - Non-EQ Sewage Sludge Land Application - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Daily Maximum	Measuring Frequency	Sampling Type	Monitoring Months
00611 - Nitrogen Ammonia, Total In Sludge - mg/kg		1/Year	Composite	December
00627 - Nitrogen Kjeldahl, Total In Sludge - mg/kg		1/Year	Composite	December
01003 - Arsenic, Total In Sludge - mg/kg	75	1/Year	Composite	December
01028 - Cadmium, Total In Sludge - mg/kg	85	1/Year	Composite	December
01043 - Copper, Total In Sludge - mg/kg	4,300	1/Year	Composite	December
01052 - Lead, Total In Sludge - mg/kg	840	1/Year	Composite	December
01068 - Nickel, Total In Sludge - mg/kg	420	1/Year	Composite	December
01093 - Zinc, Total In Sludge - mg/kg	7,500	1/Year	Composite	December
01148 - Selenium, Total In Sludge - mg/kg	100	1/Year	Composite	December
51129 - Sludge Fee Weight - Dry Tons		1/Year	Total	December
70316 - Sludge Weight - Dry Tons		1/Year	Total	December
71921 - Mercury, Total In Sludge - mg/kg	57	1/Year	Composite	December
78465 - Molybdenum, Total In Sludge - mg/kg	75	1/Year	Composite	December

NOTES for Station Number _581:
Monitoring is required when sewage sludge is removed from the Permittee's facility for application to the land. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

Example sewage sludge stations for < 70 dry tons sewage sludge per calendar year

Table - Sewage Sludge Monitoring - 582 - Stockpiled or Stored Sewage Sludge - Final

Effluent Characteristic	Discharge Limitations	Monitoring Requirements		
Parameter	Daily Maximum	Measuring Frequency	Sampling Type	Monitoring Months
70316 - Sludge Weight - Dry Tons		1/Year	Total	December

NOTES for Station Number _582:
Monitoring is required when sewage sludge is stockpiled or stored. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

[NOTE: It is intended this station would be an annual reporting requirement regardless of the volume of dry tons of sewage sludge generated]

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SQUIRE SANDERS | LEGAL COUNSEL WORLDWIDE

February 9, 2006

To: Fifth Third Securities, Inc.
Cincinnati, Ohio

We have examined the transcript of proceedings relating to the issuance by the County of Logan, Ohio, of its $615,000 Sewer System Improvement Note, Series 2006A, dated February 9, 2006, bearing interest at the rate of 4.21% per year, payable at maturity, maturing on February 7, 2007, and issued in anticipation of the issuance of bonds for the purpose of paying the cost of improving the Logan County Water Pollution Control District by rehabilitating manholes, improving lift stations and sewer lines, constructing a sanitary pump station and related sewer lines, grading, installing screening, filter press and diffuser equipment, constructing an equalization basin, improving aerobic digestion equipment, and installing a septic receiving site, together with all necessary appurtenances thereto. We have also examined a conformed copy of the signed Note.

Based on this examination we are of the opinion that, under existing law:

1. The Note constitutes a valid and legal general obligation of the County, and the principal of and interest on the bonds in anticipation of which the Note is issued, unless paid from other sources and subject to bankruptcy laws and other laws affecting creditors' rights and to the exercise of judicial discretion, are to be paid from the proceeds of the levy of ad valorem taxes, within the ten-mill limitation imposed by law, on all property subject to ad valorem taxes levied by the County.

2. The interest on the Note is excluded from gross income for federal income tax purposes under Section 103 of the Internal Revenue Code of 1986, as amended (the "*Code*"), and is not an item of tax preference under Section 57 of the Code for purposes of the alternative minimum tax imposed on individuals and corporations. The interest on the Note, and any profit made on its sale, exchange or other disposition, are exempt from the Ohio personal income tax, the Ohio commercial activity tax, the net income base of the Ohio corporate franchise tax, and municipal and school district income taxes in Ohio. The Note is a "qualified tax-exempt obligation" as defined in Section 265(b)(3) of the Code. We express no opinion as to any other tax consequences regarding the Note.

In giving the foregoing opinion with respect to the treatment of the interest on the Note and the status of the Note under the federal tax laws, we have assumed and relied upon continuing compliance with the County's covenants and the accuracy, which we have not independently verified, of the County's representations and certifications, all as contained in the transcript. The accuracy of those representations

and certifications, and continuing compliance by the County with those covenants, may be necessary for the interest to be and to remain excluded from gross income for federal income tax purposes and for the other federal tax effects stated above. Failure to comply with certain of those covenants subsequent to issuance could cause the interest on the Note to be included in gross income for federal income tax purposes retroactively to its date of issuance.

Under the Code, portions of the interest on the Note earned by certain corporations may be subject to a corporate alternative minimum tax, and interest on the Note may be subject to a branch profits tax imposed on certain foreign corporations doing business in the United States and to a tax imposed on excess net passive income of certain S corporations.

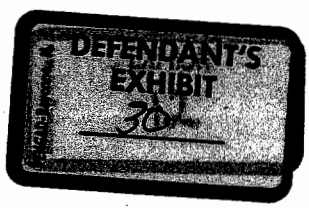
Respectfully submitted,

Squire, Sanders & Dempsey L.L.P.

LOGAN COUNTY WATER POLLUTION CONTROL
INDIAN LAKE WASTEWATER TREATMENT PLANT IMPROVEMENTS
UPDATED COST ESTIMATE COMPARISON

September 18, 2006

Items	General Plan	60% Cost
Manhole Rehabilitation	$900,000	-
Lift Station Improvements	$387,000	-
Midway Sewers	$146,000	-
Slough Area Improvements	$1,151,000	$1,021,900
Yard Grading and Piping	$150,000	$243,000
Screen Building & Splitter Box	$635,000	$650,000
Demolition of Grit Equipment	$35,000	-
Equalization Basin	$1,100,000	$1,840,000
Aeration Tank (Diffuser Upgrade)	$250,000	$246,000
Aerated Sludge Holding	$600,000	$614,000 ✓
Solids Handling Facility	$420,000	$865,000 ✓
Septage Receiving Station	$285,000	$253,000
Instrumentation and Control	$150,000	-
Contingency	$600,000	-
Demolition	-	$124,000
Electrical*	-	$895,000
Plumbing*	-	$107,000
HVAC*	-	$179,000
SUBTOTAL	**$6,809,000**	**$7,037,900**
Additional Items Outside of General Plan		
Raw Wastewater Pump Station	-	$150,000
Equalization Tanks	-	$43,000
Control Building	-	$131,000
Equalization Tank Lift Station	-	$117,000
Ultraviolet Disinfection/Chlorination	$400,000	$297,000
Utility Building (@ Secondary Digesters)	-	$6,000
SUBTOTAL	**$400,000**	**$744,000**
TOTAL CONSTRUCTION COSTS	**$7,209,000**	**$7,781,900**
Project Costs	$1,702,000	-
Engineering	-	$1,086,900
Permits	-	$15,500
Legal, Accounting, etc.	-	?
TOTAL PROJECT COSTS	**$8,911,000**	**$8,884,300**

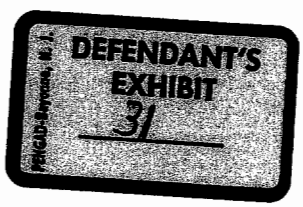


POLICY ON CIVIL PENALTIES

EPA GENERAL ENFORCEMENT POLICY #GM - 21

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

EFFECTIVE DATE: FEB 16 1984



Introduction

This document, Policy on Civil Penalties, establishes a single set of goals for penalty assessment in EPA administrative and judicial enforcement actions. These goals - deterrence, fair and equitable treatment of the regulated community, and swift resolution of environmental problems - are presented here in general terms. An outline of the general process for the assessment of penalties is contained in Attachment A.

A companion document, A Framework for Statute-Specific Approaches to Penalty Assessments, will also be issued today. This document provides guidance to the user of the policy on how to write penalty assessment guidance specific to the user's particular program. The first part of the Framework provides general guidance on developing program-specific guidance; the second part contains a detailed appendix which explains the basis for that guidance. Thus, the user need only refer to the appendix when he wants an explanation of the guidance in the first part of the Framework.

In order to achieve the above Agency policy goals, all administratively imposed penalties and settlements of civil penalty actions should, where possible, be consistent with the guidance contained in the Framework document. Deviations from the Framework's methodology, where merited, are authorized as long as the reasons for the deviations are documented. Documentation for deviations from the Framework in program-specific guidance should be located in that guidance. Documentation for deviations from the program-specific guidance in calculating individual penalties should be contained in both the case files and in any memoranda that accompany the settlements.

The Agency will make every effort to urge administrative law judges to impose penalties consistent with this policy and any medium-specific implementing guidance. For cases that go to court, the Agency will request the statutory maximum penalty in the filed complaint. And, as proceedings warrant, EPA will continue to pursue a penalty no less than that supported by the applicable program policy. Of course, all penalties must be consistent with applicable statutory provisions, based upon the number and duration of the violations at issue.

Applicability

This policy statement does not attempt to address the specific mechanisms for achieving the goals set out for penalty assessment. Nor does it prescribe a negotiation strategy to achieve the penalty target figures. Similarly, it does not address differences between statutes or between priorities of different programs. Accordingly, it cannot be used, by itself, as a basis for determining an appropriate penalty in a specific

action. Each EPA program office, in a joint effort with the Office of Enforcement and Compliance Monitoring, will revise existing policies, or write new policies as needed. These policies will guide the assessment of penalties under each statute in a manner consistent with this document and, to the extent reasonable, the accompanying Framework.

Until new program-specific policies are issued, the current penalty policies will remain in effect. Once new program-specific policies are issued, the Agency should calculate penalties as follows:

- For cases that are substantially settled, apply the old policy.

- For cases that will require further substantial negotiation, apply the new policy if that will not be too disruptive.

Because of the unique issues associated with civil penalties in certain types of cases, this policy does not apply to the following areas:

- CERCLA §107. This is an area in which Congress has directed a particular kind of response explicitly oriented toward recovering the cost of Government cleanup activity and natural resource damage.

- Clean Water Act §311(f) and (g). This also is cost recovery in nature. As in CERCLA §107 actions, the penalty assessment approach is inappropriate.

- Clean Air Act §120. Congress has set out in considerable detail the level of recovery under this section. It has been implemented with regulations which, as required by law, prescribe a non-exclusive remedy which focuses on recovery of the economic benefit of noncompliance. It should be noted, however, that this general penalty policy builds upon, and is consistent with the approach Congress took in that section.

Much of the rationale supporting this policy generally applies to non-profit institutions, including government entities. In applying this policy to such entities, EPA must exercise judgment case-by-case in deciding, for example, how to apply the economic benefit and ability to pay sanctions, if at all. Further guidance on the issue of seeking penalties against non-profit entities will be forthcoming.

Deterrence

The first goal of penalty assessment is to deter people from violating the law. Specifically, the penalty should persuade the violator to take precautions against falling into noncompliance again (specific deterrence) and dissuade others from violating the law (general deterrence). Successful deterrence is important because it provides the best protection for the environment. In addition, it reduces the resources necessary to administer the laws by addressing noncompliance before it occurs.

If a penalty is to achieve deterrence, both the violator and the general public must be convinced that the penalty places the violator in a worse position than those who have complied in a timely fashion. Neither the violator nor the general public is likely to believe this if the violator is able to retain an overall advantage from noncompliance. Moreover, allowing a violator to benefit from noncompliance punishes those who have complied by placing them at a competitive disadvantage. This creates a disincentive for compliance. For these reasons, it is Agency policy that penalties generally should, at a minimum, remove any significant economic benefits resulting from failure to comply with the law. This amount will be referred to as the "benefit component" of the penalty.

Where the penalty fails to remove the significant economic benefit, as defined by the program-specific guidance, the case development team must explain in the case file why it fails to do so. The case development team must then include this explanation in the memorandum accompanying each settlement for the signature of the Assistant Administrator of Enforcement and Compliance Monitoring, or the appropriate Regional official.

The removal of the economic benefit of noncompliance only places the violator in the same position as he would have been if compliance had been achieved on time. Both deterrence and fundamental fairness require that the penalty include an additional amount to ensure that the violator is economically worse off than if it had obeyed the law. This additional amount should reflect the seriousness of the violation. In doing so, the penalty will be perceived as fair. In addition the penalty's size will tend to deter other potential violators.

In some classes of cases, the normal gravity calculation may be insufficient to effect general deterrence. This could happen if, for example, there was extensive noncompliance with certain regulatory programs in specific areas of the United States. This would demonstrate that the normal penalty assessments had not been achieving general deterrence. In such cases, the case development team should consider increasing the gravity component sufficient to

achieve general deterrence. These extra assessments should balance the other goals of this policy, particularly equitable treatment of the regulated community.

This approach is consistent with the civil penalty provisions in the environmental laws. Almost all of them require consideration of the seriousness of the violation. This additional amount which reflects the seriousness of the violation is referred to as the "gravity component". The combination of the benefit and gravity components yields the "preliminary deterrence figure."

As explained later in this policy, the case development team will adjust this figure as appropriate. Nevertheless, EPA typically should seek to recover, at a minimum, a penalty which includes the benefit component plus some non-trivial gravity component. This is important because otherwise, regulated parties would have a general economic incentive to delay compliance until the Agency commenced an enforcement action. Once the Agency brought the action, the violator could then settle for a penalty less than their economic benefit of noncompliance. This incentive would directly undermine the goal of deterrence.

Fair and Equitable Treatment of the Regulated Community

The second goal of penalty assessment is the fair and equitable treatment of the regulated community. Fair and equitable treatment requires that the Agency's penalties must display both consistency and flexibility. The consistent application of a penalty policy is important because otherwise the resulting penalties might be seen as being arbitrarily assessed. Thus violators would be more inclined to litigate over those penalties. This would consume Agency resources and make swift resolution of environmental problems less likely.

But any system for calculating penalties must have enough flexibility to make adjustments to reflect legitimate differences between similar violations. Otherwise the policy might be viewed as unfair. Again, the result would be to undermine the goals of the Agency to achieve swift and equitable resolutions of environmental problems.

Methods for quantifying the benefit and gravity components are explained in the Framework guidance. These methods significantly further the goal of equitable treatment of violators. To begin with, the benefit component promotes equity by removing the unfair economic advantage which a violator may have gained over complying parties. Furthermore, because the benefit and gravity components are generated systematically, they

will exhibit relative consistency from case to case. Because the methodologies account for a wide range of relevant factors, the penalties generated will be responsive to legitimate differences between cases.

However, not all the possibly relevant differences between cases are accounted for in generating the preliminary deterrence amount. Accordingly, all preliminary deterrence amounts should be increased or mitigated for the following factors to account for differences between cases:

- Degree of willfulness and/or negligence
- History of noncompliance.
- Ability to pay.
- Degree of cooperation/noncooperation.
- Other unique factors specific to the violator or the case.

Mitigation based on these factors is appropriate to the extent the violator clearly demonstrates that it is entitled to mitigation.

The preliminary deterrence amount adjusted prior to the start of settlement negotiations yields the "initial penalty target figure". In administrative actions, this figure generally is the penalty assessed in the complaint. In judicial actions, EPA will use this figure as the first settlement goal. This settlement goal is an internal target and should not be revealed to the violator unless the case development team feels that it is appropriate. The initial penalty target may be further adjusted as negotiations proceed and additional information becomes available or as the original information is reassessed.

Swift Resolution of Environmental Problems

The third goal of penalty assessment is swift resolution of environmental problems. The Agency's primary mission is to protect the environment. As long as an environmental violation continues, precious natural resources, and possibly public health, are at risk. For this reason, swift correction of identified environmental problems must be an important goal of any enforcement action. In addition, swift compliance conserves Agency personnel and resources.

The Agency will pursue two basic approaches to promoting quick settlements which include swift resolution of environmental problems without undermining deterrence. Those two approaches are as follows:

1. Provide incentives to settle and institute prompt remedial action.

EPA policy will be to provide specific incentives to settle, including the following:

- The Agency will consider reducing the gravity component of the penalty for settlements in which the violator already has instituted expeditious remedies to the identified violations prior to the commencement of litigation.1/ This would be considered in the adjustment factor called degree of cooperation/noncooperation discussed above.

- The Agency will consider accepting additional environmental cleanup, and mitigating the penalty figures accordingly. But normally, the Agency will only accept this arrangement if agreed to in pre-litigation settlement.

Other incentives can be used, as long as they do not result in allowing the violator to retain a significant economic benefit.

2. Provide disincentives to delaying compliance.

The preliminary deterrence amount is based in part upon the expected duration of the violation. If that projected period of time is extended during the course of settlement negotiations due to the defendant's actions, the case development team should adjust that figure upward. The case development team should consider making this fact known to the violator early in the negotiation process. This will provide a strong disincentive to delay compliance.

1/ For the purposes of this document, litigation is deemed to begin:

- for administrative actions - when the respondent files a response to an administrative complaint or when the time to file expires or

- for judicial actions - when an Assistant United States Attorney files a complaint in court.

Intent of Policy and Information Requests for Penalty Calculations

The policies and procedures set out in this document and in the Framework for Statute-Specific Approaches to Penalty Assessment are intended solely for the guidance of government personnel. They are not intended and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. The Agency reserves the right to act at variance with these policies and procedures and to change them at any time without public notice. In addition, any penalty calculations under this policy made in anticipation of litigation are exempt from disclosure under the Freedom of Information Act. Nevertheless as a matter of public interest, the Agency may elect to release this information in some cases.

Courtney M. Price
Assistant Administrator for
Enforcement and Compliance Monitoring

Attachment

ATTACHMENT A

Outline of Civil Penalty Assessment

I. Calculate Preliminary Deterrence Amount

A. Economic benefit component and

B. Gravity component

(This yields the preliminary deterrence amount.)

II. Apply Adjustment Factors

A. Degree of cooperation/noncooperation (indicated through pre-settlement action.)

B. Degree of willfulness and/or negligence.

C. History of noncompliance.

D. Ability to pay (optional at this stage.)

E. Other unique factors (including strength of case, competing public policy concerns.)

(This yields the initial penalty target figure.)

III. Adjustments to Initial Penalty Target Figure After Negotiations Have Begun

A. Ability to pay (to the extent not considered in calculating initial penalty target.)

B. Reassess adjustments used in calculating initial penalty target. (Agency may want to reexamine evidence used as a basis for the penalty in the light of new information.)

C. Reassess preliminary deterrence amount to reflect continued periods of noncompliance not reflected in the original calculation.

D. Alternative payments agreed upon prior to the commencement of litigation.

(This yields the adjusted penalty target figure.)

A FRAMEWORK FOR STATUTE-SPECIFIC APPROACHES TO PENALTY ASSESSMENTS: IMPLEMENTING EPA'S POLICY ON CIVIL PENALTIES

EPA GENERAL ENFORCEMENT POLICY #GM - 22

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

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Introduction

This document, A Framework for Statute-Specific Approaches to Penalty Assessment, provides guidance to the user of the Policy on Civil Penalties on how to develop a medium-specific penalty policy. Such policies will apply to administratively imposed penalties and settlements of both administrative and judicial penalty actions.

In the Policy on Civil Penalties, the Environmental Protection Agency establishes a single set of goals for penalty assessment. Those goals - deterrence, fair and equitable treatment of the regulated community, and swift resolution of environmental problems - will be substantially impaired unless they are pursued in a consistent fashion. Even different terminology could cause confusion that would detract from the achievement of these goals. At the same time, too much rigidity will stifle negotiation and make settlement impossible.

The purpose of this document is to promote the goals of the Policy on Civil Penalties by providing a framework for medium-specific penalty policies. The Framework is detailed enough to allow individual programs to develop policies that will consistently further the Agency's goals and be easy to administer. In addition, it is general enough to allow each program to tailor the policy to the relevant statutory provisions and the particular priorities of each program.

While this document contains detailed guidance, it is not cast in absolute terms. Nevertheless, the policy does not encourage deviation from this guidance in either the development of medium-specific policies or in developing actual penalty figures. Where there are deviations in developing medium-specific policies, the reasons for those changes must be recorded in the actual policy. Where there are deviations from medium-specific policies in calculating a penalty figure, the case development team must detail the reasons for those changes in the case file. In addition, the rationale behind the deviations must be incorporated in the memorandum accompanying the settlement package to Headquarters or the appropriate Regional official.

This document is divided into two sections. The first one gives brief instructions to the user on how to write a medium-specific policy. The second section is an appendix that gives detailed guidance on implementing each section of the instructions and explains how the instructions are intended to further the goals of the policy.

Writing a Program Specific Policy

Summarized below are those elements that should be present in a program-specific penalty policy. For a detailed discussion of each of these ideas, the corresponding portions of the appendix should be consulted.

I. Developing a Penalty Figure

The development of a penalty figure is a two step process. First the case development team must calculate a preliminary deterrence figure. This figure is composed of the economic benefit component (where applicable) and the gravity component. The second step is to adjust the preliminary deterrence figure through a number of factors. The resulting penalty figure is the initial penalty target figure. In judicial actions, the initial penalty target figure is the penalty amount which the government normally sets as a goal at the outset of settlement negotiations. It is essentially an internal settlement goal and should not be revealed to the violator unless the case development team feels it is appropriate. In administrative actions, this figure generally is the penalty assessed in the complaint. While in judicial actions, the government's complaint will request the maximum penalty authorized by law.

This initial penalty target figure may be further adjusted in the course of negotiations. Each policy should ensure that the penalty assessed or requested is within any applicable statutory constraints, based upon the number and duration of violations at issue.

II. Calculating a Preliminary Deterrence Amount

Each program-specific policy must contain a section on calculating the preliminary deterrence figure. That section should contain materials on each of the following areas:

- Benefit Component. This section should explain:

  a. the relevent measure of economic benefit for various types of violations,
  b. the information needed,
  c. where to get assistance in computing this figure and
  d. how to use available computer systems to compare a case with similar previous violations.

- Gravity Component. This section should first rank different types of violations according to the seriousness of the act. In creating that ranking, the following factors should be considered:

  a. actual or possible harm,
  b. importance to the regulatory scheme and
  c. availability of data from other sources.

In evaluating actual or possible harm, your scheme should consider the following facts:

- amount of pollutant,
- toxicity of pollutant,
- sensitivity of the environment,
- length of time of a violation and
- size of the violator.

The policy then should assign appropriate dollar amounts or ranges of amounts to the different ranked violations to constitute the "gravity component". This amount, added to the amount reflecting economic benefit, constitutes the preliminary deterrence figure.

III. Adjusting the Preliminary Deterrence Amount to Derive the Initial Penalty Target Figure (Prenegotiation Adjustment)

Each program-specific penalty policy should give detailed guidance on applying the appropriate adjustments to the preliminary deterrence figure. This is to ensure that penalties also further Agency goals besides deterrence (i.e. equity and swift correction of environmental problems). Those guidelines should be consistent with the approach described in the appendix. The factors may be separated according to whether they can be considered before or after negotiation has begun or both.

Adjustments (increases or decreases, as appropriate) that can be made to the preliminary deterrence penalty to develop an initial penaly target to use at the outset of negotiation include:

- Degree of willfulness and/or negligence
- Cooperation/noncooperation through pre-settlement action.
- History of noncompliance.

- Ability to pay.

- Other unique factors (including strength of case, competing public policy considerations).

The policy may permit consideration of the violator's ability to pay as an adjustment factor before negotiations begin. It may also postpone consideration of that factor until after negotiations have begun. This would allow the violator to produce evidence substantiating its inability to pay.

The policy should prescribe appropriate amounts, or ranges of amounts, by which the preliminary deterrence penalty should be adjusted. Adjustments will depend on the extent to which certain factors are pertinent. In order to preserve the penalty's deterrent effect, the policy should also ensure that, except for the specific exceptions described in this document, the adjusted penalty will: 1) always remove any significant economic benefit of noncompliance and 2) contain some non-trivial amount as a gravity component.

IV. Adjusting the Initial Penalty Target During Negotiations

Each program-specific policy should call for periodic reassessment of these adjustments during the course of negotiations. This would occur as additional relevant information becomes available and the old evidence is re-evaluated in the light of new evidence. Once negotiations have begun, the policy also should permit adjustment of the penalty target to reflect "alternative payments" the violator agrees to make in settlement of the case. Adjustments for alternative payments and pre-settlement corrective action are generally permissible only before litigation has begun.

Again, the policy should be structured to ensure that any settlement made after negotiations have begun reflects the economic benefit of noncompliance up to the date of compliance plus some non-trivial gravity component. This means that if lengthy settlement negotiations cause the violation to continue longer than initially anticipated, the penalty target figure should be increased. The increase would be based upon the extent that the violations continue to produce ongoing environmental risk and increasing economic benefit.

Use of the Policy In Litigation

Each program-specific policy should contain a section on the use of the policy in litigation. Requests for penalties

should account for all the factors identified in the relevant statute and still allow for compromises in settlement without exceeding the parameters outlined in this document. (For each program, all the statutory factors are contained in the Framework either explicitly or as part of broader factors.) For administrative proceedings, the policy should explain how to formulate a penalty figure, consistent with the policy. The case development team will put this figure in the administrative complaint.

In judicial actions, the EPA will use the initial penalty target figure as its first settlement goal. This settlement goal is an internal target and should not be revealed to the violator unless the case development team feels it is appropriate. In judicial litigation, the government should request the maximum penalty authorized by law in its complaint. The policy should also explain how it and any applicable precedents should be used in responding to any explicit requests from a court for a minimum assesment which the Agency would deem appropriate.

Use of the Policy as a Feedback Device

Each program-specific policy should first explain in detail what information needs to be put into the case file and into the relevant computer tracking system. Furthermore, each policy should cover how to use that system to examine penalty assessments in other cases. This would thereby assist the Agency in making judgments about the size of adjustments to the penalty for the case at hand. Each policy should also explain how to present penalty calculations in litigation reports.

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Attachment

APPENDIX

Introduction

This appendix contains three sections. The first two sections set out guidelines for achieving the goals of the Policy on Civil Penalties. The first section focuses on achieving deterrence by assuring that the penalty first removes any economic benefit from noncompliance. Then it adds an amount to the penalty which reflects the seriousness of the violation. The second section provides adjustment factors so that both a fair and equitable penalty will result and that there will be a swift resolution of the environmental problem. The third section of the framework presents some practical advice on the use of the penalty figures generated by the policy.

The Preliminary Deterrence Amount

The Policy on Civil Penalties establishes deterrence as an important goal of penalty assessment. More specifically, it specifies that any penalty should, at a minimum, remove any significant benefits resulting from noncompliance. In addition, it should include an amount beyond removal of economic benefit to reflect the seriousness of the violation. That portion of the penalty which removes the economic benefit of noncompliance is referred to as the "benefit component;" that part of the penalty which reflects the seriousness of the violation is referred to as the "gravity component." When combined, these two components yield the "preliminary deterrence amount."

This section of the document provides guidelines for calculating the benefit component and the gravity component. It will also present and discuss a simplified version of the economic benefit calculation for use in developing quick penalty determinations. This section will also discuss the limited circumstances which justify settling for less than the benefit component. The uses of the preliminary deterrence amount will be explained in subsequent portions of this document.

I. The Benefit Component

In order to ensure that penalties remove any significant economic benefit of noncompliance, it is necessary to have reliable methods to calculate that benefit. The existence of reliable methods also strengthens the Agency's position in both litigation and negotiation. This section sets out guidelines for computing the benefit component. It first addresses costs which are delayed by noncompliance. Then it addresses costs which are avoided completely by noncompliance. It also identifies issues

to be considered when computing the benefit component for those violations where the benefit of noncompliance results from factors other than cost savings. This section concludes with a discussion of the proper use of the benefit component in developing penalty figures and in settlement negotiations.

A. Benefit from delayed costs

In many instances, the economic advantage to be derived from noncompliance is the ability to delay making the expenditures necessary to achieve compliance. For example, a facility which fails to construct required settling ponds will eventually have to spend the money needed to build those ponds in order to achieve compliance. But, by deferring these one-time nonrecurring costs until EPA or a State takes an enforcement action, that facility has achieved an economic benefit. Among the types of violations which result in savings from deferred cost are the following:

- Failure to install equipment needed to meet discharge or emission control standards.
- Failure to effect process changes needed to eliminate pollutants from products or waste streams.
- Testing violations, where the testing still must be done to demonstrate achieved compliance.
- Improper disposal, where proper disposal is still required to achieve compliance.
- Improper storage where proper storage is still required to achieve compliance.
- Failure to obtain necessary permits for discharge, where such permits would probably be granted. (While the avoided cost for many programs would be negligible, there are programs where the the permit process can be expensive).

The Agency has a substantial amount of experience under the air and water programs in calculating the economic benefit that results from delaying costs necessary to achieve compliance. This experience indicates that it is possible to estimate the benefit of delayed compliance through the use of a simple formula. Specifically, the economic benefit of delayed compliance may be estimated at: 5% per year of the delayed one-time capital cost for the period from the date the violation began until the date

compliance was or is expected to be achieved. This will be referred to as the "rule of thumb for delayed compliance" method. Each program may adopt its own "rule of thumb" if appropriate. The applicable medium-specific guidance should state what that method is.

The rule of thumb method can usually be used in making decisions on whether to develop a case or in setting a penalty target for settlement negotiations. In using this rule of thumb method in settlement negotiations, the Agency may want to make the violator fully aware that it is using an estimate and not a more precise penalty determination procedure. The decision whether to reveal this information is up to the negotiators.

The "rule of thumb" method only provides a first-cut estimate of the benefit of delayed compliance. For this reason, its use is probably inappropriate in situations where a detailed analysis of the economic effect of noncompliance is needed to support or defend the Agency's position. Accordingly, this "rule of thumb" method generally should not be used in any of the following circumstances:

- A hearing is likely on the amount of the penalty.
- The defendant wishes to negotiate over the amount of the economic benefit on the basis of factors unique to the financial condition of the company.
- The case development team has reason to believe it will produce a substantially inaccurate estimate; for example, where the defendant is in a highly unusual financial position, or where noncompliance has or will continue for an unusually long period.

There usually are avoided costs associated with this type of situation. Therefore, the "rule of thumb for avoided costs" should also be applied. (See pages 9-10). For most cases, both figures are needed to yield the major portion of the economic benefit component.

When the rule of thumb method is not applicable, the economic benefit of delayed compliance should be computed using the Methodology for Computing the Economic Benefit of Noncompliance. This document, which is under development, provides a method for computing the economic benefit of noncompliance based on a detailed economic analysis. The method will largely be a refined version of the method used in the previous Civil Penalty Policy issued July 8, 1980, for the Clean Water Act and Title I of the Clean Air Act. It will also be consistent with the regulations

implementing Section 120 of the Clean Air Act. A computer program will be available to the Regions to perform the analysis, together with instructions for its use. Until the Methodology is issued, the economic model contained in the July 8, 1980, Civil Penalty Policy should be used. It should be noted that the Agency recently modified this guidance to reflect changes in the tax law.

B. Benefit from avoided costs

Many kinds of violations enable a violator to permanently avoid certain costs associated with compliance.

- Cost savings for operation and maintenance of equipment that the violator failed to install.
- Failure to properly operate and maintain existing control equipment.
- Failure to employ sufficient number of adequately trained staff.
- Failure to establish or follow precautionary methods required by regulations or permits.
- Improper storage, where commercial storage is reasonably available.
- Improper disposal, where redisposal or cleanup is not possible.
- Process, operational, or maintenance savings from removing pollution equipment.
- Failure to conduct necessary testing.

As with the benefit from delayed costs, the benefit component for avoided costs may be estimated by another "rule of thumb" method. Since these costs will never be incurred, the estimate is the expenses avoided until the date compliance is achieved less any tax savings. The use of this "rule of thumb" method is subject to the same limitations as those discussed in the preceding section.

Where the "rule of thumb for avoided costs" method cannot be used, the benefit from avoided costs must be computed using the Methodology for Computing the Economic Benefit of Noncompliance. Again, until the Metholology is issued, the method contained in the July 8, 1980, Civil Penalty Policy should be used as modified to reflect recent changes in the tax law.

C. Benefit from competitive advantage

For most violations, removing the savings which accrue from noncompliance will usually be sufficient to remove the competitive advantage the violator clearly has gained from noncompliance. But there are some situations in which noncompliance allows the violator to provide goods or services which are not available elsewhere or are more attractive to the consumer. Examples of such violations include:

- Selling banned products.
- Selling products for banned uses.
- Selling products without required labelling or warnings.
- Removing or altering pollution control equipment for a fee, (e.g., tampering with automobile emission controls.)
- Selling products without required regulatory clearance, (e.g., pesticide registration or premanufacture notice under TSCA.)

To adequately remove the economic incentive for such violations, it is helpful to estimate the net profits made from the improper transactions (i.e. those transactions which would not have occurred if the party had complied). The case development team is responsible for identifying violations in which this element of economic benefit clearly is present and significant. This calculation may be substantially different depending on the type of violation. Consequently the program-specific policies should contain guidance on identifying these types of violations and estimating these profits. In formulating that guidance, the following principles should be followed:

- The amount of the profit should be based on the best information available concerning the number of transactions resulting from noncompliance.
- Where available, information about the average profit per transaction may be used. In some cases, this may be available from the rulemaking record of the provision violated.
- The benefit derived should be adjusted to reflect the present value of net profits derived in the past.

It is recognized that the methods developed for estimating the profit from those transactions will sometimes rely substantially on expertise rather than verifiable data. Nevertheless, the programs should make all reasonable efforts to ensure that the estimates developed are defensible. The programs are encouraged to work with the Office of Policy, Planning and Evaluation to ensure that the methods developed are consistent with the forthcoming Methodology for Computing the Economic Benefit of Noncompliance and with methods developed by other programs. The programs should also ensure that sufficient contract funds are available to obtain expert advice in this area as needed to support penalty development, negotiation and trial of these kinds of cases.

D. Settling cases for an amount less than the economic benefit

As noted above, settling for an amount which does not remove the economic benefit of noncompliance can encourage people to wait until EPA or the State begins an enforcement action before complying. For this reason, it is general Agency policy not to settle for less than this amount. There are three general areas where settling for less than economic benefit may be appropriate. But in any individual case where the Agency decides to settle for less than enconomic benefit, the case development team must detail those reasons in the case file and in any memoranda accompanying the settlement.

1. Benefit component involves insignificant amount

It is clear that assessing the benefit component and negotiating over it will often represent a substantial commitment of resources. Such a commitment of resources may not be warranted in cases where the magnitude of the benefit component is not likely to be significant, (e.g. not likely to have a substantial impact on the violator's competitive positions). For this reason, the case development team has the discretion not to seek the benefit component where it appears that the amount of that component is likely to be less than $10,000. (A program may determine that other cut-off points are more reasonable based on the likelihood that retaining the benefit could encourage noncomplying behavior.) In exercising that discretion, the case development team should consider the following factors:

- Impact on violator: The likelihood that assessing the benefit component as part of the penalty will have a noticeable effect on the violator's competitive position or overall profits. If no such effect appears likely, the benefit component should probably not be pursued.

- The size of the gravity component: If the gravity component is relatively small, it may not provide a sufficient deterrent, by

itself, to achieve the goals of this policy.

- The certainty of the size of the benefit component: If the economic benefit is quite well defined, it is not likely to require as much effort to seek to include it in the penalty assessment. Such circumstances also increase the likelihood that the economic benefit was a substantial motivation for the noncompliance. This would make the inclusion of the benefit component more necessary to achieve specific deterrence.

It may be appropriate not to seek the benefit component in an entire class of violation. In that situation, the rationale behind that approach should be clearly stated in the appropriate medium-specific policy. For example, the most appropriate way to handle a small non-recurring operation and maintenance violation may be a small penalty. Obviously it makes little sense to assess in detail the economic benefit for each individual violation because the benefit is likely to be so small. The medium-specific policy would state this as the rationale.

2. Compelling public concerns

The Agency recognizes that there may be some instances where there are compelling public concerns that would not be served by taking a case to trial. In such instances, it may become necessary to consider settling a case for less than the benefit component. This may be done only if it is absolutely necessary to preserve the countervailing public interests. Such settlements might be appropriate where the following circumstances occur:

- There is a very substantial risk of creating precedent which will have a significant adverse effect upon the Agency's ability to enforce the law or clean up pollution if the case is taken to trial.

- Settlement will avoid or terminate an imminent risk to human health or the environment. This is an adequate justification only if injunctive relief is unavailable for some reason, and if settlement on remedial responsibilities could not be reached independent of any settlement of civil penalty liability.

- Removal of the economic benefit would result in plant closings, bankruptcy, or other extreme financial burden, and there is an important public interest in allowing the firm to continue in business.

Alternative payment plans should be fully explored before resorting to this option. Otherwise, the Agency will give the perception that shirking one's environmental responsibilities is a way to keep a failing enterprise afloat. This exemption does not apply to situations where the plant was likely to close anyway, or where there is a likelihood of continued harmful noncompliance.

3. Litigation practicalities

The Agency realizes that in certain cases, it is highly unlikely the EPA will be able to recover the economic benefit in litigation. This may be due to applicable precedent, competing public interest considerations, or the specific facts, equities, or evidentiary issues pertaining to a particular case. In such a situation it is unrealistic to expect EPA to obtain a penalty in litigation which would remove the economic benefit. The case development team then may pursue a lower penalty amount.

II. The Gravity Component

As noted above, the Policy on Civil Penalties specifies that a penalty, to achieve deterrence, should not only remove any economic benefit of noncompliance, but also include an amount reflecting the seriousness of the violation. This latter amount is referred to as the "gravity component." The purpose of this section of the document is to establish an approach to quantifying the gravity component. This approach can encompass the differences between programs and still provide the basis for a sound consistent treatment of this issue.

A. Quantifying the gravity of a violation

Assigning a dollar figure to represent the gravity of a violation is an essentially subjective process. Nevertheless, the relative seriousness of different violations can be fairly accurately determined in most cases. This can be accomplished by reference to the goals of the specific regulatory scheme and the facts of each particular violation. Thus, linking the dollar amount of the gravity component to these objective factors is a useful way of insuring that violations of approximately equal seriousness are treated the same way.

Such a linkage promotes consistency. This consistency strengthens the Agency's position both in negotiation and before a trier of fact. This approach consequently also encourages swift resolution of environmental problems.

Each program must develop a system for quantifying the gravity of violations of the laws and regulations it administers.

This development must occur within the context of the penalty amounts authorized by law for that program. That system must be based, whenever possible, on objective indicators of the seriousness of the violation. Examples of such indicators are given below. The seriousness of the violation should be based primarily on: 1) the risk of harm inherent in the violation at the time it was committed and 2) the actual harm that resulted from the violation. In some cases, the seriousness of the risk of harm will exceed that of the actual harm. Thus, each system should provide enough flexibility to allow EPA to consider both factors in assessing penalties.

Each system must also be designed to minimize the possibility that two persons applying the system to the same set of facts would come up with substantially different numbers. Thus, to the extent the system depends on categorizing events, those categories must be clearly defined. That way there is little possibility for argument over the category in which a violation belongs. In addition, the categorization of the events relevant to the penalty decision should be noted in the penalty development portion of the case file.

B. Gravity Factors

In quantifying the gravity of a violation, a program-specific policy should rank different types of violations according to the seriousness of the act. The following is a suggested approach to ranking the seriousness of violations. In this approach to ranking, the following factors should be considered:

- Actual or possible harm: This factor focuses on whether (and to what extent) the activity of the defendant actually resulted or was likely to result in an unpermitted discharge or exposure.

- Importance to the regulatory scheme: This factor focuses on the importance of the requirement to achieving the goal of the statute or regulation. For example, if labelling is the only method used to prevent dangerous exposure to a chemical, then failure to label should result in a relatively high penalty. By contrast, a warning sign that was visibly posted but was smaller than the required size would not normally be considered as serious.

- Availability of data from other sources: The violation of any recordkeeping or reporting requirement is a very serious

matter. But if the involved requirement is the only source of information, the violation is far more serious. By contrast, if the Agency has another readily available and cheap source for the necessary information, a smaller penalty may be appropriate. (E.g. a customer of the violator purchased all the violator's illegally produced substance. Even though the violator does not have the required records, the customer does.)

- Size of violator: In some cases, the gravity component should be increased where it is clear that the resultant penalty will otherwise have little impact on the violator in light of the risk of harm posed by the violation. This factor is only relevant to the extent it is not taken into account by other factors.

The assessment of the first gravity factor listed above, risk or harm arising from a violation, is a complex matter. For purposes of ranking violations according to seriousness, it is possible to distinguish violations within a category on the basis of certain considerations, including the following:

- Amount of pollutant: Adjustments for the concentration of the pollutant may be appropriate, depending on the regulatory scheme and the characteristics of the pollutant. Such adjustments need not be linear, especially if the pollutant can be harmful at low concentrations.

- Toxicity of the pollutant: Violations involving highly toxic pollutants are more serious and should result in relatively larger penalties.

- Sensitivity of the environment: This factor focuses on the location where the violation was committed. For example, improper discharge into waters near a drinking water intake or a recreational beach is usually more serious than discharge into waters not near any such use.

- The length of time a violation continues: In most circumstances, the longer a violation continues uncorrected, the greater is the risk of harm.

Although each program-specific policy should address each of the factors listed above, or determine why it is not relevant, the factors listed above are not meant to be exhaustive. The programs should make every effort to identify all factors relevant to assessing the seriousness of any violation. The programs should then systematically prescribe a dollar amount to yield a gravity component for the penalty. The program-specific policies may prescribe a dollar range for a certain category of violation rather than a precise dollar amount within that range based on the specific facts of an individual case.

The process by which the gravity component was computed must be memorialized in the case file. Combining the benefit component with the gravity component yields the preliminary deterrence amount.

In some classes of cases, the normal gravity calculation may be insufficient to effect general deterrence. This could happen if there was extensive noncompliance with certain regulatory programs in specific areas of the United States. This would demonstrate that the normal penalty assessments had not been achieving general deterrence. The medium specific policies should address this issue. One possible approach would be to direct the case development team to consider increasing the gravity component within a certain range to achieve general deterrence. These extra assessments should be consistent with the other goals of this policy.

Initial and Adjusted Penalty Target Figure

The second goal of the Policy on Civil Penalties is the equitable treatment of the regulated community. One important mechanism for promoting equitable treatment is to include the benefit component discussed above in a civil penalty assessment. This approach would prevent violators from benefitting economically from their noncompliance relative to parties which have complied with environmental requirements.

In addition, in order to promote equity, the system for penalty assessment must have enough flexibility to account for the unique facts of each case. Yet it still must produce enough consistent results to treat similarly-situated violators similarly. This is accomplished by identifying many of the legitimate differences between cases and providing guidelines for how to adjust the preliminary deterrence amount when those facts occur. The application of these adjustments to the preliminary deterrence amount prior to the commencement of negotiation yields the initial penalty target figure. During the course of negotiation, the case development team may further adjust this figure to yield the adjusted penalty target figure.

Nevertheless, it should be noted that equitable treatment is a two-edged sword. While it means that a particular violator will receive no higher penalty than a similarly situated violator, it also means that the penalty will be no lower.

I. Flexibility-Adjustment Factors

The purpose of this section of the document is to establish additional adjustment factors to promote flexibility and to identify management techniques that will promote consistency. This section sets out guidelines for adjusting penalties to account for some factors that frequently distinguish different cases. Those factors are: degree of willfulness and/or negligence, degree of cooperation/noncooperation, history of noncompliance, ability to pay, and other unique factors. Unless otherwise specified, these adjustment factors will apply only to the gravity component and not to the economic benefit component. Violators bear the burden of justifying mitigation adjustments they propose based on these factors.

Within each factor there are three suggested ranges of adjustment. The actual ranges for each medium-specific policy will be determined by those developing the policy. The actual ranges may differ from these suggested ranges based upon program specific needs. The first, typically a 0-20% adjustment of the gravity component, is within the absolute discretion of the case development team. 1/ The second, typically a 21-30% adjustment, is only appropriate in unusual circumstances. The third range, typically beyond 30% adjustment, is only appropriate in extraordinary circumstances. Adjustments in the latter two ranges, unusual and extraordinary circumstances, will be subject to scrutiny in any performance audit. The case development team may wish to reevaluate these adjustment factors as the negotiations progress. This allows the team to reconsider evidence used as a basis for the penalty in light of new information.

Where the Region develops the penalty figure, the application of adjustment factors will be part of the planned Regional audits. Headquarters will be responsible for proper application of these factors in nationally-managed cases. A detailed discussion of these factors follows.

A. Degree of Willfulness and/or Negligence

Although most of the statutes which EPA administers are strict liability statutes, this does not render the violator's

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1/ Absolute discretion means that the case development team may make penalty development decisions independent of EPA Headquarters. Nevertheless it is understood that in all judicial matters, the Department of Justice can still review these determinations if they so desire. Of course the authority to exercise the Agency's concurrence in final settlements is covered by the applicable delegations.

willfulness and/or negligence irrelevant. Knowing or willful violations can give rise to criminal liability, and the lack of any culpability may, depending upon the particular program, indicate that no penalty action is appropriate. Between these two extremes, the willfulness and/or negligence of the violator should be reflected in the amount of the penalty.

In assessing the degree of willfulness and/or negligence, all of the following points should be considered in most cases:

- How much control the violator had over the events constituting the violation.
- The forseeability of the events constituting the violation.
- Whether the violator took reasonable precautions against the events constituting the violation.
- Whether the violator knew or should have known of the hazards associated with the conduct.
- The level of sophistication within the industry in dealing with compliance issues and/or the accessibility of appropriate control technology (if this information is readily available). This should be balanced against the technology forcing nature of the statute, where applicable.
- Whether the violator in fact knew of the legal requirement which was violated.

It should be noted that this last point, lack of knowledge of the legal requirement, should never be used as a basis to reduce the penalty. To do so would encourage ignorance of the law. Rather, knowledge of the law should serve only to enhance the penalty.

The amount of control which the violator had over how quickly the violation was remedied is also relevent in certain circumstances. Specifically, if correction of the environmental problem was delayed by factors which the violator can clearly show were not reasonably foreseeable and out of its control, the penalty may be reduced.

The suggested approach for this factor is for the case development team to have absolute discretion to adjust the penalty up or down by 20% of the gravity component. Adjustments in the $\pm$ 21-30% range should only be made in unusual circumstances.

Adjustments for this factor beyond ± 30% should be made only in extraordinary circumstances. Adjustments in the unusual or extraordinary circumstance range will be subject to scrutiny in any audit of performance.

B. Degree of Cooperation/Noncooperation

The degree of cooperation or noncooperation of the violator in remedying the violation is an appropriate factor to consider in adjusting the penalty. Such adjustments are mandated by both the goals of equitable treatment and swift resolution of environmental problems. There are three areas where this factor is relevant.

1. Prompt reporting of noncompliance

Cooperation can be manifested by the violator promptly reporting its noncompliance. Assuming such self-reporting is not required by law, such behavior should result in the mitigation of any penalty.

The suggested ranges of adjustment are as follows. The case development team has absolute discretion on any adjustments up to ± 10% of the gravity component for cooperation/noncooperation. Adjustments can be made up to ± 20% of the gravity component, but only in unusual circumstances. In extraordinary circumstances, such as self reporting of a TSCA premanufacture notice violation, the case development team may adjust the penalty beyond the ± 20% factor. Adjustments in the unusual or extraordinary circumstances ranges will be subject to scrutiny in any performance audit.

2. Prompt correction of environmental problems

The Agency should provide incentives for the violator to commit to correcting the problem promptly. This correction must take place before litigation is begun, except in extraordinary circumstances.2/ But since these incentives must be consistent with deterrence, they must be used judiciously.

2/ For the purposes of this document, litigation is deemed to begin:

- for administrative actions - when the respondent files a response to an administrative complaint or when the time to file expires or
- for judicial actions - when an Assistant United States Attorney files a complaint in court.

The circumstances under which the penalty is reduced depend on the type of violation involved and the source's response to the problem. A straightforward reduction in the amount of the gravity component of the penalty is most appropriate in those cases where either: 1) the environmental problem is actually corrected prior to initiating litigation, or 2) ideally, immediately upon discovery of the violation. Under this approach, the reduction typically should be a substantial portion of the unadjusted gravity component.

In general, the earlier the violator instituted corrective action after discovery of the violation and the more complete the corrective action instituted, the larger the penalty reduction EPA will consider. At the discretion of the case development team, the unadjusted gravity component may be reduced up to 50%. This would depend on how long the environmental problem continued before correction and the amount of any environmental damage. Adjustments greater than 50% are permitted, but will be the subject of close scrutiny in auditing performance.

It should be noted that in some instances, the violator will take all necessary steps toward correcting the problem but may refuse to reach any agreement on penalties. Similarly, a violator may take some steps to ameliorate the problem, but choose to litigate over what constitutes compliance. In such cases, the gravity component of the penalty may be reduced up to 25% at the discretion of the case development team. This smaller adjustment still recognizes the efforts made to correct the environmental problem, but the benefit to the source is not as great as if a complete settlement is reached. Adjustments greater than 25% are permitted, but will be the subject of close scrutiny in auditing performance.

In all instances, the facts and rationale justifying the penalty reduction must be recorded in the case file and included in any memoranda accompanying settlement.

3. Delaying compliance

Swift resolution of environmental problems will be encouraged if the violator clearly sees that it will be financially disadvantageous for the violator to litigate without remedying noncompliance. The settlement terms described in the preceding section are only available to parties who take steps to correct a problem prior to initiation of litigation. To some extent, this is an incentive to comply as soon as possible. Nevertheless, once litigation has commenced, it should be clear that the defendant litigates at its own risk.

In addition, the methods for computing the benefit component and the gravity component are both structured so that the penalty target increases the longer the violation remains uncorrected. The larger penalty for longer noncompliance is systematically linked to the benefits accruing to the violator and to the continuing risk to human health and the environment. This occurs even after litigation has commenced. This linkage will put the Agency in a strong position to convince the trier of fact to impose such larger penalties. For these reasons, the Policy on Civil Penalties provides substantial disincentives to litigating without complying.

C. History of noncompliance

Where a party has violated a similar environmental requirement before, this is usually clear evidence that the party was not deterred by the Agency's previous enforcement response. Unless the previous violation was caused by factors entirely out of the control of the violator, this is an indication that the penalty should be adjusted upwards.

In deciding how large these adjustments should be, the case development team should consider the following points:

- How similar the previous violation was.
- How recent the previous violation was.
- The number of previous violations.
- Violator's response to previous violation(s) in regard to correction of the previous problem.

Detailed criteria for what constitutes a "similar violation" should be contained in each program-specific policy. Nevertheless a violation should generally be considered "similar" if the Agency's previous enforcement response should have alerted the party to a particular type of compliance problem. Some facts that indicate a "similar violation" was committed are as follows:

- The same permit was violated.
- The same substance was involved.
- The same process points were the source of the violation.
- The same statutory or regulatory provision was violated.

- A similar act or omission (e.g. the failure to properly store chemicals) was the basis of the violation.

For purposes of this section, a "prior violation" includes any act or omission for which a formal enforcement response has occurred (e.g. notice of violation, warning letter, complaint, consent decree, consent agreement, or final order). It also includes any act or omission for which the violator has previously been given written notification, however informal, that the Agency believes a violation exists.

In the case of large corporations with many divisions or wholly-owned subsidiaries, it is sometimes difficult to determine whether a previous instance of noncompliance should trigger the adjustments described in this section. New ownership often raises similar problems. In making this determination, the case development team should ascertain who in the organization had control and oversight responsibility for the conduct resulting in the violation. In some situations the same persons or the same organizational unit had or reasonably should have had control or oversight responsibility for violative conduct. In those cases, the violation will be considered part of the compliance history of that regulated party.

In general, the case development team should begin with the assumption that if the same corporation was involved, the adjustments for history of noncompliance should apply. In addition, the case development team should be wary of a party changing operators or shifting responsibility for compliance to different groups as a way of avoiding increased penalties. The Agency may find a consistent pattern of noncompliance by many divisions or subsidiaries of a corporation even though the facilities are at different geographic locations. This often reflects, at best, a corporate-wide indifference to environmental protection. Consequently, the adjustment for history of noncompliance should probably apply unless the violator can demonstrate that the other violating corporate facilities are independent.

The following are the Framework's suggested adjustment ranges. If the pattern is one of "dissimilar" violations, relatively few in number, the case development team has absolute discretion to raise the penalty amount by 35%. For a relatively large number of dissimilar violations, the gravity component can be increased up to 70%. If the pattern is one of "similar" violations, the case development team has absolute discretion to raise the penalty amount up to 35% for the first repeat violation, and up to 70% for further repeated similar violations. The case development team may make higher adjustments in extraordinary circumstances, but such adjustments will be subject to scrutiny in any performance audit.

D. Ability to pay

The Agency will generally not request penalties that are clearly beyond the means of the violator. Therefore EPA should consider the ability to pay a penalty in arriving at a specific final penalty assessment. At the same time, it is important that the regulated community not see the violation of environmental requirements as a way of aiding a financially troubled business. EPA reserves the option, in appropriate circumstances, of seeking a penalty that might put a company out of business.

For example, it is unlikely that EPA would reduce a penalty where a facility refuses to correct a serious violation. The same could be said for a violator with a long history of previous violations. That long history would demonstrate that less severe measures are ineffective.

The financial ability adjustment will normally require a significant amount of financial information specific to the violator. If this information is available prior to commencement of negotiations, it should be assessed as part of the initial penalty target figure. If it is not available, the case development team should assess this factor after commencement of negotiation with the source.

The burden to demonstrate inability to pay, as with the burden of demonstrating the presence of any mitigating circumstances, rests on the defendant. If the violator fails to provide sufficient information, then the case development team should disregard this factor in adjusting the penalty. The National Enforcement Investigations Center (NEIC) has developed the capability to assist the Regions in determining a firm's ability to pay. Further information on this system will be made available shortly under separate cover.

When it is determined that a violator cannot afford the penalty prescribed by this policy, the following options should be considered:

- Consider a delayed payment schedule: Such a schedule might even be contingent upon an increase in sales or some other indicator of improved business. This approach is a real burden on the Agency and should only be considered on rare occasions.

- Consider non-monetary alternatives, such as public service activities: For example, in the mobile source program, fleet operators who tampered with pollution control devices

on their vehicles agreed to display anti-tampering ads on their vehicles. Similar solutions may be possible in other industries.

- Consider straight penalty reductions as a last recourse: If this approach is necessary, the reasons for the case development team's conclusion as to the size of the necessary reduction should be made a part of the formal enforcement file and the memorandum accompanying the settlement. 3/

- Consider joinder of the violator's individual owners: This is appropriate if joinder is legally possible and justified under the circumstances.

Regardless of the Agency's determination of an appropriate penalty amount to pursue based on ability to pay considerations, the violator is still expected to comply with the law.

E. Other unique factors

Individual programs may be able to predict other factors that can be expected to affect the appropriate penalty amount. Those factors should be identified and guidelines for their use set out in the program-specific policies. Nevertheless, each policy should allow for adjustment for unanticipated factors which might affect the penalty in each case.

It is suggested that there be absolute discretion to adjust penalties up or down by 10% of the gravity component for such reasons. Adjustments beyond the absolute discretion range will be subject to scrutiny during audits. In addition, they will primarily be allowed for compelling public policy concerns or the strengths and equities of the case. The rationale for the reduction must be expressed in writing in the case file and in any memoranda accompanying the settlement. See the discussion on pages 12 and 13 for further specifics on adjustments appropriate on the basis of either compelling public policy concerns or the strengths and equities of the case.

II. Alternative Payments

In the past, the Agency has accepted various environmentally beneficial expenditures in settlement of a case and chosen not to

3/ If a firm fails to pay the agreed-to penalty in an administrative or judicial final order, then the Agency must follow the Federal Claims Collection Act procedures for obtaining the penalty amount.

pursue more severe penalties. In general, the regulated community has been very receptive to this practice. In many cases, violators have found "alternative payments" to be more attractive than a traditional penalty. Many useful projects have been accomplished with such funds. But in some instances, EPA has accepted for credit certain expenditures whose actual environmental benefit has been somewhat speculative.

The Agency believes that these alternative payment projects should be reserved as an incentive to settlement before litigation. For this reason, such arrangements will be allowed only in prelitigation agreements except in extraordinary circumstances.

In addition, the acceptance of alternative payments for environmentally beneficial expenditures is subject to certain conditions. The Agency has designed these conditions to prevent the abuse of this procedure. Most of the conditions below applied in the past, but some are new. All of these conditions must be met before alternative payments may be accepted:4/

- No credits can be given for activities that currently are or will be required under current law or are likely to be required under existing statutory authority in the forseeable future (e.g., through upcoming rulemaking).

- The majority of the project's environmental benefit should accrue to the general public rather than to the source or any particular governmental unit.

- The project cannot be something which the violator could reasonably be expected to do as part of sound business practices.

4/ In extraordinary circumstances, the Agency may choose not to pursue higher penalties for "alternative" work done prior to commencement of negotiations. For example, a firm may recall a product found to be in violation despite the fact that such recall is not required. In order for EPA to forgo seeking higher penalties, the violator must prove that it has met the other conditions herein stated. If the violator fails to prove this in a satisfactory manner, the case development team has the discretion to completely disallow the credit project. As with all alternative projects, the case development team has the discretion to still pursue some penalties in settlement.

- EPA must not lower the amount it decides to accept in penalties by more than the after-tax amount the violator spends on the project.5/

In all cases where alternative payments are allowed, the case file should contain documentation showing that each of the conditions listed above have been met in that particular case. In addition when considering penalty credits, Agency negotiators should take into account the following points:

- The project should not require a large amount of EPA oversight for its completion. In general the less oversight the proposed credit project would require from EPA to ensure proper completion, the more receptive EPA can be toward accepting the project in settlement.

- The project should receive stronger consideration if it will result in the abatement of existing pollution, ameliorate the pollution problem that is the basis of the government's claim and involve an activity that could be ordered by a judge as equitable relief.

- The project should receive stronger consideration if undertaken at the facility where the violation took place.

- The company should agree that any publicity it disseminates regarding its funding of the project must include a statement that such funding is in settlement of a lawsuit brought by EPA or the State.

5/ This limitation does not apply to public awareness activities such as those employed for fuel switching and tampering violations under the Clean Air Act. The purpose of the limitation is to preserve the deterrent value of the settlement. But these violations are often the result of public misconceptions about the economic value of these violations. Consequently, the public awareness activities can be effective in preventing others from violating the law. Thus, the high general deterrent value of public awareness activities in these circumstances obviates the need for the one-to-one requirement on penalty credits.

Each alternative payment plan must entail an identified project to be completely performed by the defendant. Under the plan, EPA must not hold any funds which are to be spent at EPA's discretion unless the relevant statute specifically provides that authority. The final order, decree or judgment should state what financial penalty the violator is actually paying and describe as precisely as possible the credit project the violator is expected to perform.

III. Promoting Consistency

Treating similar situations in a similar fashion is central to the credibility of EPA's enforcement effort and to the success of achieving the goal of equitable treatment. This document has established several mechanisms to promote such consistency. Yet it still leaves enough flexibility for settlement and for tailoring the penalty to particular circumstances. Perhaps the most important mechanisms for achieving consistency are the systematic methods for calculating the benefit component and gravity component of the penalty. Together, they add up to the preliminary deterrence amount. The document also sets out guidance on uniform approaches for applying adjustment factors to arrive at an initial penalty target prior to beginning settlement negotiations or an adjusted penalty target after negotiations have begun.

Nevertheless, if the Agency is to promote consistency, it is essential that each case file contain a complete description of how each penalty was developed. This description should cover how the preliminary deterrence amount was calculated and any adjustments made to the preliminary deterrence amount. It should also describe the facts and reasons which support such adjustments. Only through such complete documentation can enforcement attorneys, program staff and their managers learn from each others' experience and promote the fairness required by the Policy on Civil Penalties.

To facilitate the use of this information, Office of Legal and Enforcement Policy will pursue integration of penalty information from judicial enforcement actions into a computer system. Both Headquarters and all Regional offices will have access to the system through terminals. This would make it possible for the Regions to compare the handling of their cases with those of other Regions. It could potentially allow the Regions, as well as Headquarters, to learn from each others' experience and to identify problem areas where policy change or further guidance is needed.

Use of Penalty Figure in Settlement Discussions

The Policy and Framework do not seek to constrain negotiations. Their goal is to set settlement target figures for the internal use of Agency negotiators. Consequently, the penalty figures under negotiation do not necessarily have to be as low as the internal target figures. Nevertheless, the final settlement figures should go no lower than the internal target figures unless either: 1) the medium-specific penalty policy so provides or 2) the reasons for the deviation are properly documented.

INTERIM CLEAN WATER ACT SETTLEMENT PENALTY POLICY

March 1, 1995

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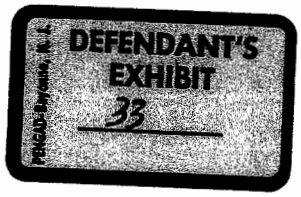

I. INTRODUCTION

Section 309 of the Clean Water Act (CWA), (33 U.S.C. §1319) authorizes the Administrator of the U.S. Environmental Protection Agency ("EPA" or "Agency") to bring civil judicial and administrative actions against those who violate certain enumerated requirements of the CWA. In such actions the Administrator may seek civil penalties.

EPA brings enforcement actions to require alleged violators to promptly correct the violations and remedy any harm caused by the violations. As part of an enforcement action, EPA also seeks substantial monetary penalties which promote environmental compliance and help protect public health by deterring future violations by the same violator and deterring violations by other members of the regulated community. Penalties help ensure a national level playing field by ensuring that violators do not obtain an unfair economic advantage over competitors who have done whatever was necessary to comply on time. Penalties also encourage companies to adopt pollution prevention and recycling techniques, so that they minimize their pollutant discharges and reduce their potential liabilities.

This Policy implements the Agency's February 1984 general *Policy on Civil Penalties* (#GM-21) and the companion document, *A Framework for Statute Specific Approaches to Penalty Assessments* (#GM-22), both issued on February 16, 1984. This Policy revises and hereby supersedes the *Clean Water Act Penalty Policy for Civil Settlement Negotiations* issued on February 11, 1986.[1]

This document sets forth the policy of the EPA for establishing appropriate penalties in settlement of civil judicial and administrative actions. Subject to the circumstances of a particular case, this policy provides the lowest penalty figure which the Federal Government should accept in a settlement. This Policy is drafted so that violators whose actions, or inactions, resulted in a significant economic benefit and/or harmed or threatened public health or the environment will pay the highest penalties. Obviously, where settlement is not possible, the Government reserves the right to seek penalties up to the statutory maximum.

II. PURPOSE

[1] The guidances issued to interpret and supplement the 1986 Penalty Policy are also superseded. These documents are the: Addendum to the Clean Water Act Civil Penalty Policy for Administrative Penalties, issued August 28, 1987; Guidance on Penalty Calculations for POTW Failure to Implement an Approved Pretreatment Program, issued December 22, 1988; Bottomline Penalties for Cases Involving More than Five Years of Non-Compliance, issued May 11, 1992; Gravity Penalty Pilot Policy for Clean Water Act Cases, issued November 12, 1992; and Final Interim Guidance on Use of Litigation Consideration Reductions in the Clean Water Act Penalty Policy, issued October 10, 1993 (which incorporated the November 1992 Gravity Penalty Pilot Policy).

The purpose of this Policy is to further four important environmental goals. First, penalties should be large enough to deter noncompliance. Second, penalties should help ensure a level playing field by ensuring that violators do not obtain an economic advantage over their competitors. These two goals generally require that penalties recover the economic benefit of noncompliance, plus an appropriate gravity amount. Third, CWA penalties should be generally consistent across the country. This is desirable as it not only prevents the creation of "pollution havens" in different parts of the nation, but also provides fair and equitable treatment to the regulated community wherever they may operate. Fourth, settlement penalties should be based on a logical calculation methodology to promote swift resolution of enforcement actions and the underlying violations.

III. APPLICABILITY

This Policy applies to all CWA civil judicial and administrative actions filed after the effective date of this Policy, and to all such pending cases in which the government has not yet transmitted to the defendant or respondent an oral or written proposed settlement penalty amount. This Policy also may be applied (instead of the 1986 version) in pending cases in which penalty negotiations have commenced if application of this Policy would not be disruptive to the negotiations. This Policy applies to civil judicial and administrative penalties sought under CWA §309, including: violations of NPDES permit limits and conditions; discharges without an NPDES permit; violations of pretreatment standards and requirements (including local limits and pretreatment programs); violations of §405 sludge use or disposal requirements; violations of §308 information requests; and violations of §309(a) compliance orders. This Policy does not apply to actions brought exclusively under CWA §311 (oil and hazardous substance spills) nor for violations of requirements in §404 ("wetlands" cases involving disposal of dredged or fill material). Separate penalty policies apply to these two types of cases.

This Policy sets forth how the Agency generally expects to exercise its enforcement discretion in deciding on an appropriate enforcement response and determining an appropriate settlement penalty. In some cases, the calculation methodology set forth here may not be appropriate, in whole or part; in such cases, with the advance approval of the Assistant Administrator, an alternative or modified approach may be used.

This Policy only establishes how the Agency expects to calculate the minimum penalty for which it would be willing to settle a case. The development of the penalty amount to plead in an administrative or judicial complaint is developed independent of this Policy, except that the Agency may not seek a settlement penalty in excess of the statutory maximum penalty for the violations alleged in the complaint. This Policy is not intended for use by EPA, violators, courts, or administrative judges in determining penalties at a hearing or trial. (Also see §VI below).

A settlement penalty calculation is generally required before the Agency files an administrative complaint or refers a civil action to the Department of Justice. The penalty

calculation should be revised as relevant new information is discovered during the course of the litigation. The penalty calculation should be reviewed periodically (e.g.,on the anniversary of when the complaint was filed) to determine if any revisions to the calculation are necessary.

IV. PENALTY CALCULATION METHODOLOGY

Before proceeding to calculate the settlement penalty, Agency staff should estimate the statutory maximum penalty in order to determine the potential maximum penalty liability of the discharger.[2] The penalty which the government seeks in settlement may not exceed this statutory maximum amount. Examples of how to calculate the statutory maximum are set forth in Attachment 1. In general, the statutory maximum penalty for violations of an effluent limit for a period longer than one day includes a separate penalty for each day in the time period (assuming there was a discharge on each day).

The settlement penalty is calculated based on this formula:

Penalty = Economic Benefit + Gravity +/- Gravity Adjustment Factors - Litigation Considerations - Ability to Pay - Supplemental Environmental Projects.

Each component of the penalty calculation is discussed below. A worksheet summarizing the penalty calculation is included as Attachment 2.

A. Economic Benefit

Consistent with EPA's February 1984 *Policy on Civil Penalties,* every effort should be made to calculate and recover the economic benefit of noncompliance. The objective of the economic benefit calculation is to place violators in the same financial position as they would have been if they had complied on time. Persons that violate the CWA are likely to have obtained an economic benefit as a result of delayed or completely avoided pollution control expenditures during the period of noncompliance. Commonly delayed and avoided CWA pollution control expenditures, include, but are not limited to:

- Monitoring and Reporting (including costs of the sampling and proper laboratory analysis);

- Capital equipment improvements or repairs, including engineering design, purchase, installation, and replacement;

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[2] This calculation of the statutory maximum penalty, done as part of the settlement penalty calculation, is a legal evaluation, subject to the attorney-work product privilege. This calculation is not intended for use in court.

- o Operation and maintenance expenses (e.g. labor, power, chemicals) and other annual expenses; and

- o One-time acquisitions (such as land purchase).

The standard method in settlement efforts for calculating the economic benefit from delayed and avoided pollution control expenditures is through the use of the Agency's BEN model. Refer to the "BEN User's Manual" (Office of Enforcement, December 1993, or any subsequent revision) for specific information on the operation and proper use of BEN. There is no minimum amount triggering the use of the BEN model. In estimating economic benefit using the BEN model, the benefit should be calculated from the first date of noncompliance, but EPA generally does not go back no more than five years prior to the date when the complaint should be filed.[3]

The BEN model will produce a valid estimate of the economic benefit from delayed and avoided compliance costs only if it is properly used.[4] Before using the BEN model you need a defensible theory of on-time compliance: that is, the pollution control system or measures the violator should have installed and operated earlier to have prevented the CWA violations at issue in the case.[5] As a general rule, the best evidence of what the violator should have done to prevent the violations, is what it eventually does (or will do) to achieve compliance.[6]

In some cases, the BEN model may not be an appropriate methodology for estimating economic benefit or will not capture the full scope of the economic benefit. For example, if the violator is a privately-owned regulated utility, the standard BEN model may not be appropriate. In this situation, the Agency should consider a wrongful profits analysis and seek to recover the profits and other competitive market benefits the violator obtained as a result of operating during the period of violation.[7] In another type of case, if the violator decides that its "method of

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[3] The five year guideline for when the BEN and gravity calculations starts is a policy decision. Legally, there is nothing that prevents EPA from calculating economic benefit or gravity from the first date of violation, even if that is more than five years before the complaint is filed, as long as the statutory maximum penalty (calculated pursuant to the five year statute of limitations) exceeds the settlement penalty amount.

[4] The BEN model does not calculate the "competitive advantage" benefits a firm may have obtained as a result of operating in violation of the law. Such benefits include profits and increases in market share from selling goods and services during the period of violation.

[5] The BEN model is comparing the compliance costs the violator would have paid if it had complied on-time, versus the usually smaller compliance costs it actually pays by complying late.

[6] See BEN User's Manual, December 1993, page 6-2.

[7] Regions should consult Headquarters for how to conduct this analysis; a financial consultant is likely to be needed.

compliance" is to cease operations at the facility, conducting a BEN analysis may be complicated.[8] In a few unusual cases, economic benefit may be negative: this means, e.g., operating the old inefficient treatment system was more expensive than purchasing and operating a new, more efficient treatment system. When economic benefit is negative, the settlement calculation enters zero as the economic benefit.

B. Gravity Component

The gravity calculation methodology is based upon a logical scheme and criteria that quantifies the gravity of the violation based upon the CWA and its regulatory programs. Every reasonable effort must be made to calculate and recover a gravity component in addition to the economic benefit component. As EPA's February 1984 *Policy on Civil Penalties,* states on page 4:

> The removal of the economic benefit of noncompliance only places the violator in the same position as he would have been if compliance had been achieved on time. Both deterrence and fundamental fairness require that the penalty include an additional amount to ensure that the violator is economically worse off than if [he] had obeyed the law.

The gravity component of the penalty is calculated for each month in which there was a violation. The total gravity component for the penalty calculation equals the sum of each monthly gravity component. The monthly gravity formula is:

Monthly gravity component = (1 + A + B + C + D) x $1,000.

The four gravity factors -- A, B, C, and D -- are considered for each month in which there were one or more violations. Values are assigned to each of the four factors as described in the text and tables below. In performing the gravity calculation, the monthly gravity component is calculated from the first date of noncompliance up to when the violations ceased or the date the complaint is expected to be filed, but EPA has the option to start the gravity calculation no more than five years prior to the date when the complaint should be filed. (See footnote #4.) In cases with continuing violations, the gravity calculation should be revised periodically to include additional months of violations that have occurred since the previous calculation.

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[8] In cases where a facility determines that it can only comply by ceasing operations, an appropriate BEN analysis would be to input the savings obtained from the delayed closure costs and the avoided costs of not treating the wastewater during the period of noncompliance. See Appendix B in BEN User's Manual. If it is not possible to estimate these avoided treatment costs, then a wrongful profit analysis is necessary.

"A" -- Significance of Violation (Monthly Range 0 to 20). This factor is based on the degree of exceedance of the most significant effluent limit violation in each month. Values for this factor are selected from within designated ranges; violations of toxic monthly effluent limits are weighted most heavily. Values are selected using the table below based on the effluent value which yields the highest factor A value. Regions select a particular value for factor A within the designated range. For purposes of this table conventional and nonconventional pollutants include biochemical oxygen demand, chemical oxygen demand, total oxygen demand, dissolved oxygen, total organic carbon, total suspended solids, total dissolved solids, inorganic phosphorous compounds, inorganic nitrogen compounds, oil and grease, calcium, chloride, fluoride, magnesium, sodium, potassium, sulfur, sulfate, total alkalinity, total hardness, aluminum, cobalt, iron, vanadium and temperature. Factor A values for fecal coliform and pH, which are calculated using logarithmic scales, are calculated using the special scales at the bottom of the table. All other pollutants are classified as toxic pollutants.

If there were no effluent limit violations in a particular month, but there were other violations, then factor A is assigned a value of zero in that month's gravity calculation. In pretreatment cases in which the industrial user was not required to provide monthly compliance reports, and provided less frequent effluent data (e.g., in a 40 CFR §403.12(e) periodic compliance report), any effluent violations reported in the report are assumed to represent identical violations in each month of the reporting period for purposes of calculating gravity if there is substantial evidence supporting this assumption. Examples of such evidence are: (1) no pretreatment equipment was in operation during the period and (2) the production and treatment operations remained consistent during the period. This means the monthly gravity calculation, with a factor A value, should be repeated for all of the months covered by the report.[9] If there was no evidence indicating continuing violations throughout the period covered by the periodic compliance report, then a value for Factor A should be assigned only for the month in which the sampling occurred. If the industrial user did not notify the control authority and repeat the sampling after finding the effluent violation as required by 40 CFR §403.12(g)(2), then an appropriate value for gravity Factor D should be assigned for this notification or monitoring violation(s).

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[9] The pretreatment regulations, 40 CFR §403.12(g)(3), require the periodic compliance reports to contain data which "is representative of conditions occurring during the reporting period." For example, if an industrial user reports in its December (semi-annual) periodic compliance report that it violated the daily maximum cadmium limit by 150% in September, and this was the most significant effluent violation, using the Gravity Factor A Table, factor A will be assigned a value between 3 and 7 for each of the six months covered by the report (July - December) if, e.g., EPA had evidence that the facility lacked treatment equipment during that period and wastewater generating operations were consistent during the period.

GRAVITY FACTOR A -- SIGNIFICANCE OF THE VIOLATION

Select a value for factor A based on the effluent limit violated in the month which produces the highest range of values for factor A.

Percent by which effluent limit was exceeded:			Factor A Value Ranges	
Monthly Average	7-day Average	Daily Maximum	Toxic Pollutants	Conventional & Nonconventional Pollutants
1 - 20	1 - 30	1 - 50	1 - 3	0 - 2
21 - 40	31 - 60	51 - 100	1 - 4	1 - 3
41 - 100	61 - 150	101 - 200	3 - 7	2 - 5
101 - 300	151 - 450	201 - 600	5 - 15	3 - 6
301 - >	451 - >	601 - >	10 - 20	5 - 15

Percent Exceedance of Fecal Coliform Limit:	Standard Units above or below pH limit:	Factor A Value Ranges:
0 - 100	0 - .50	0 - 5
101 - 500	.51 - 2.0	2 - 8
501 - 5,000	2.01 - 3.0	4 - 10
5,001 - >	3.01 - 4.0	6 - 12
	4.01 - >	8 - 15

"B" -- Health and Environmental Harm (Monthly Range 0 to 50). A value for this factor is selected for each month in which one or more violations present actual or potential harm to human health or to the environment. Values are selected using the table below based on the type of actual or potential harm that yields the highest factor value.

GRAVITY FACTOR B -- HEALTH AND ENVIRONMENTAL HARM	
Type of Actual or Potential Harm	**Factor B Value Ranges**
Impact on Human Health (e.g., interference with drinking water supplies, harm or increased risks to subsistence fishing)	10 - 50
Impact on Aquatic Environment (or the POTW)	
Water quality-based effluent standard(s) or whole effluent toxicity limit violated	1 - 10
Fish kill, beach closing, restrictions on use of water body; or pass through or interference at the POTW caused by the IU discharge.	4 - 50
Other impact on aquatic environment	2 - 25

"C" -- Number of Effluent Limit Violations (Monthly Range 0 to 5). This factor is based on the total number of effluent limit violations each month. (Violations of interim limitations in administrative orders are not counted here, but included as part of recalcitrance.) In order to properly quantify the gravity of the violations, all effluent limit violations are considered and evaluated. Violations of different parameters at the same outfall are counted separately and violations of the same parameter at different outfalls are counted separately. The guidelines in Attachment 1 for calculating the statutory maximum penalty are generally not applicable for selecting the value for gravity factor C (e.g., violation of a weekly limit need not be calculated as 7 separate violations). A minimum factor C value of 1 is generally appropriate whenever there are violations of two or more different pollutants. Values for this factor may be selected by comparing the number of effluent limits exceeded with the number of effluent limits in the permit: e.g., if all of the limits in the permit were violated in a month, a value of 5 would be appropriate; if 50 percent of the limits in the permit were violated, a factor of 2 or 3 would be appropriate.

"D" -- Significance of Non-effluent Limit Violations. This factor has a value ranging from 0 (zero) to 70 and is based on the severity and number of the six different types of non-effluent limitation requirements violated each month. There are six types of non-effluent violations: 1) monitoring and reporting; 2) pretreatment program implementation; 3) sludge handling; 4) unauthorized discharges; 5) permit milestone schedules; and 7) other types of non-effluent violations. The value for factor D for each month in which there is a non-effluent limit violation is selected pursuant to the table on the next page. The factor D value for a given month is the sum of the highest value for each type of non-effluent limit violation.

With regards to monitoring and reporting violations, the failure to submit a report in a timely manner should generally not be treated as a continuing violation past the month in which the report is due. For example, if an industrial user fails to submit a baseline monitoring report as required by 40 CFR 403.12(b), this should be counted as a violation only in the month when the

report was due. Given the importance of such a report, if the violator fails to submit the report at all a factor D value of 5 or more may be appropriate for this violation.[10]

With regards to pretreatment program implementation violations, "key program activities" include: identifying all industrial users; issuing appropriate control mechanisms to all significant industrial users (SIUs); inspecting SIUs; enforcing industrial user self-monitoring; enforcing pretreatment standards (including local limits); submitting pretreatment reports to the approval authority; and failing to comply with other significant pretreatment program obligations. The 1989 *Guidance for Reporting and Evaluating POTW Noncompliance with Pretreatment Requirements* or subsequent revisions may be helpful in evaluating the seriousness of pretreatment program implementation violations.

As an example of calculating factor D for a given month, assume a discharger did not sample for 4 of the 8 parameters in its permit, the discharge monitoring report was submitted 20 days late, and there were several days of discharge of a process wastestream through an unauthorized outfall without any treatment. Using the factor D table, for Type 1, a value of 4 may be selected based on the failure to conduct sampling for half of the parameters; the delay in submitting sampling data is not considered since the other Type 1 violation produces a higher value. For the unauthorized discharge of the process wastestream, a value of 6 may be selected for Type 4. Since there are no Type 2, 3, 5, and 6 violations, a value of 0 is entered for each of these Types. Thus, the total value for factor D for this month is 10.

[10] The failure to provide the regulatory agency with required sampling data on the discharge is a very serious violation as this eliminates the government's ability to perform necessary oversight and allows the discharger to avoid the possible application of gravity factor A.

GRAVITY FACTOR D – NON-EFFLUENT LIMIT VIOLATIONS	
THE FACTOR D VALUE FOR A GIVEN MONTH IS THE SUM OF THE HIGHEST VALUE FOR EACH TYPE OF NON-EFFLUENT LIMIT VIOLATION.	
Type and Extent of Violation	**Factor D Value Ranges**
1. Effluent Monitoring and Reporting Violations:	
Failure to conduct or submit adequate pollutant sampling data for 1 or more pollutant parameters (but not all parameters)	1 to 6
Failure to conduct or submit any required pollutant sampling data in a given month but with a reasonable belief that the facility was in compliance with applicable limits.	2 to 6
Failure to conduct or submit any required pollutant sampling data in a given month without a reasonable basis to believe that facility was otherwise in compliance with applicable limits.	6 to 10
Failure to conduct or submit whole effluent toxicity sampling data	4 to 10
Delay in submitting sampling data	0 to 5
Failure to submit a pretreatment baseline report, 90-day compliance report, or periodic compliance report (40 CFR 403.12(b), (d), or (e,) or failure to sample again after finding a violation (40 CFR 403.12(g)(2)).	2 to 8
Any other monitoring or reporting violation	0 to 10
2. Pretreatment Program Implementation Violations : All key program activities implemented, with some minor violations. One or two key program activities not implemented Many key program activities not implemented Few if any program activities implemented	 0 to 4 2 to 6 4 to 8 6 to 10
3. Failure to properly control, treat, or dispose of sludge	1 to 10
4. Unauthorized discharge: e.g., discharge through an unpermitted outfall, discharge of a wastestream not identified in the permit, sewer overflows, or spill (other than oil or §311 hazardous substance)	1 to 20
5. Violation of permit milestone schedule	1 to 10
6. Any other type of noneffluent limit violation	1 to 10

C. Gravity Adjustment Factors

In certain circumstances as explained below, the total monthly gravity amount may be adjusted by three factors: flow reduction factor (to reduce gravity); history of recalcitrance (to increase gravity); and the quick settlement reduction factor (to reduce gravity). The resulting figure -- benefit + (gravity +/- gravity adjustments) -- is the preliminary penalty amount.

Flow Reduction Factor for Small Facilities. The total monthly gravity amount may be reduced based on the flow of the facility. This factor is applicable to direct and indirect discharges, both municipal and non-municipals. Flow reduction percentages are selected using the table below. In order to ensure that these reductions are directed at small facilities (that are not otherwise part of large corporation), this gravity reduction does not apply to non-municipals if the facility or parent corporation employs more than 100 individuals.

FLOW REDUCTION FACTOR	
AVERAGE DAILY WASTEWATER DISCHARGE FLOW (in gallons per day)	PERCENTAGE REDUCTION FACTOR OF TOTAL GRAVITY
Less than 5,000	50
Between 5,000 and 9,999	40
Between 10,000 and 19,999	30
Between 20,000 and 29,999	20
Between 30,000 and 49,999	10
Between 50,000 and 99,999	5
100,000 and above	0 (i.e., no reduction)

History of Recalcitrance Adjustment Factor. The "recalcitrance" factor is used to increase the penalty based on a violator's bad faith, or unjustified delay in preventing, mitigating, or remedying the violation. Recalcitrance is also present if a violator failed to comply with an EPA issued administrative compliance order or a §308 information request, or with a prior state or local enforcement order. This factor is applied by multiplying the total gravity component by a percentage between 0 and 150. In administrative penalty actions, violations of administrative compliance orders are not included in the recalcitrance calculation (because EPA lacks the authority to seek penalties in the administrative forum for violations of administrative compliance orders).

A minimum recalcitrance factor of 10 percent is generally appropriate for each instance in which a violator fails to substantially comply in a timely manner with an administrative compliance

order ("AO"), a §308 information request, or a state enforcement order. Thus, if a particular discharger violated 3 AOs, a minimum recalcitrance factor of 30 percent is generally appropriate. If a violator completely fails to comply with an AO or §308 request, a recalcitrance factor of 20 percent may be appropriate for that failure, while if there were only minor violations of the AO or request, a recalcitrance factor of 5 percent may be appropriate for that violation.

Quick Settlement Adjustment Factor. In order to provide an extra incentive for violators to negotiate quickly and reasonably, and in recognition of a violator's cooperativeness, EPA may reduce the gravity amount by 10 percent if EPA expects the violator to settle quickly. For purposes of this reduction factor, in Class I administrative enforcement actions, a quick settlement is when the violator signs an administrative consent order resolving the violations within four months of the date the complaint was issued or within four months of when the government first sent the violator a written offer to settle the case, whichever date is earlier. In Class II administrative enforcement actions and judicial cases, the controlling time period is 6 and 12 months, respectively. If the violator is not able to sign the consent order within this time period, this adjustment does not apply.

Environmental Auditing Adjustment Factor. This interim revision of the Penalty Policy contains no explicit gravity adjustment factor for violators that conduct, or fail to conduct, environmental audits, disclose the results to the government, promptly correct the violations and remedy any harm. This interim revision of the Policy (and the original 1986 version), however, automatically produces smaller penalty amounts for violators who promptly remedy violations. This is because violators who promptly remedy violations will have shorter histories of violations and this automatically reduces both the economic benefit and gravity amounts. After the Agency completes its review of its environmental auditing policy, this Policy may be reissued with an explicit adjustment factor for this factor. In the interim, Regions, may with the advance approval of Headquarters, appropriately adjust the gravity amount based on the presence, or absence, of an environmental auditing program.

D. Litigation Considerations (to decrease preliminary penalty amount)

1. Overview. The government should evaluate every penalty with a view toward litigation and attempt to ascertain the maximum civil penalty the court or administrative judge is likely to award if the case proceeds to trial or hearing. Many enforcement cases may have mitigating factors, weaknesses or equitable problems that could be expected to persuade a court to assess a penalty less than the statutory maximum amount. The simple existence of weaknesses in a case, however, should not automatically result in a litigation consideration reduction of the preliminary bottom-line settlement penalty amount (economic benefit + gravity $\pm$ gravity adjustment factors). The government may reduce the amount of the civil penalty it will accept at settlement to reflect weaknesses in its case where the facts demonstrate a substantial likelihood that the government will not achieve a higher penalty at trial.

2. Legal Evaluation. The mere existence of weaknesses or limitations in a case should not result in a reduction of the preliminary bottom-line settlement penalty amount, unless the Agency determines that the preliminary settlement amount is more than EPA is likely to obtain at trial.[11] In evaluating potential litigation consideration reductions, EPA legal staff should: (a) Determine the statutory maximum penalty; (b) Evaluate what penalty the court might assess at trial given the particular strengths and weaknesses of the case; and, (c) Compare this amount to the preliminary settlement amount (benefit + gravity + recalcitrance).

While Agency legal staff cannot predict the exact penalty amount a court might assess at trial, case law indicates that a court should use the statutory maximum as its preliminary penalty figure, and then reduce that amount, as appropriate, using only the penalty assessment factors in §309(d) of the Act. Fitting the facts of EPA's enforcement case to the method adopted by the courts in recent CWA penalty decisions provides the Agency with the clearest method to estimate penalty litigation outcomes.[12]

3. Application. Adjustments for litigation considerations are taken on a factual basis specific to the case. Before a complaint is filed, the application of certain litigation considerations is almost always premature, since the Agency generally does not have enough information to fully evaluate litigation risk regarding the assigned judge's previous ruling on similar matters, the court's informed opinion, or witness performance. Other litigation considerations, including evidentiary matters, witness availability, and equitable defenses often may not be reliably demonstrated until after case filing. Reductions for these litigation considerations are more likely to be appropriate after the Agency obtains an informed view, through discovery and settlement activities, of the strengths and weaknesses in its case and how the specific court views penalties in the case. Pre-filing settlement negotiations are often helpful in identifying and evaluating litigation considerations, especially regarding potential equitable defenses, and thus reductions based on such litigation considerations may be appropriately taken before the complaint is filed. As a general rule, the greater the disparity between the maximum statutory penalty and the preliminary penalty amount, the less litigation considerations should affect the Agency's settlement position.

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[11] In many situations, weaknesses or limitations in a case are already accounted for in the preliminary penalty calculation. For example, the gravity calculation will be less in those circumstances in which the period of violation was brief, the exceedances of the limitations were small, the pollutants were not toxic, or there is no evidence of environmental harm. The economic benefit calculation also will be smaller when the violator has already returned to compliance since the period of violation will be shorter.

[12] The prevailing CWA case law on the assessment of penalties indicates that, in assessing a penalty, a court begins at the statutory maximum amount and reduces the penalty based on the specific factors set out in section 309(d) of the CWA. See Atlantic States Legal Foundation v. Tyson Foods, 897 F.2d 1128 (11th Cir. 1990). In contrast, settlement penalties calculated pursuant to this Policy build the Agency's bottom line negotiating position upward from zero, generally ending up with a figure orders of magnitude less than the statutory maximum penalty.

4. Possible Litigation Considerations. While there is no universal list of litigation considerations, the following factors may be appropriate in evaluating whether the preliminary settlement penalty exceeds the penalty the Agency would likely obtain at trial:

a. Known problems with the reliability or admissibility of the government's evidence proving liability or supporting a civil penalty;

b. The credibility, reliability, and availability of witnesses;[13]

c. The informed, expressed opinion of the judge assigned to the case (or person appointed by the judge to mediate the dispute), after evaluating the merits of the case.[14]

d. The record of the judge in any other environmental enforcement case presenting similar issues. (In contrast, the reputation of the judge, or the judge's general demeanor, without a specific penalty or legal statement on a similar case, is rarely sufficient as a litigation consideration.)

e. Statements made by federal, State or local regulators that may allow the respondent or defendant to credibly argue that it believed it was complying with the federal law under which EPA is seeking penalties.

f. The payment by the defendant of civil penalties for the same violations in a case brought by another plaintiff.[15]

g. The development of new, relevant case law.

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[13] The credibility and reliability of witnesses relates to their demeanor, reputation, truthfulness, and impeachability. For instance, if a government witness has made statements significantly contradictory to the position he is to support at trial, his credibility may be impeached by the respondent or defendant. The availability of a witness will affect the settlement bottom-line if the witness cannot be produced at trial; it does not relate to the inconvenience or expense of producing the witness at trial.

[14] This factor, except as provided below with respect to the record of the judge or other trier of fact, may not be applied in anticipation, or at the stage of initial referral, and should not be distorted by taking at face value what a judge attempting to encourage a settlement might say.

[15] If the defendant has previously paid civil penalties for the same violations to another plaintiff, this factor may be used to reduce the amount of the settlement penalty by no more than the amount previously paid for the same violations. (If the previous plaintiff was a State qualified to preempt federal enforcement under EPA's interpretation of Section 309(g)(6), EPA's complaint should not include counts already addressed by a penalty. See "Supplemental Guidance on Section 309(g)(6) (A) of the Clean Water Act," memorandum from Frederick F. Stiehl, Enforcement Counsel for Water, to Regional Counsels, March 5, 1993, and "Guidance on State Action Preempting Civil Penalty Enforcement Actions Under the Federal Clean Water Act, OE/OW, August 28, 1987.)

h. A blend of troublesome facts and weak legal arguments such that the Agency faces a significant risk of obtaining a nationally significant negative precedent at trial.

5. Not Litigation Considerations. In contrast to the above list of possible litigation considerations, the following items are not litigation considerations:

a. A generalized goal to avoid litigation or to avoid potential precedential areas of the law.[16]

b. A duplicative use of elements included or assumed elsewhere in the Penalty Policy, such as inability to pay, "good faith"[17], "lack of recalcitrance", or a lack of demonstrated environmental harm[18].

c. Off-the-record statements by the court, before it has had a chance to evaluate the specific merits of the case are, by themselves, not a reason to reduce the preliminary settlement penalty amount. (Compare with 4.c above.)

d. The fact that the receiving water is already polluted or that the water can assimilate additional pollution is not a litigation consideration.[19]

e. By itself, the failure of a regulatory agency to initiate a timely enforcement action is not a litigation consideration.[20]

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[16] A generalized desire to minimize litigation costs is not a litigation consideration.

[17] The efforts of the violator to achieve compliance or minimize the violations after EPA, a State or pretreatment control authority has initiated an enforcement action (i.e., an administrative or judicial enforcement action) do not constitute "good faith" efforts. If such efforts are undertaken before the regulatory agency initiates an enforcement response, the settlement penalty calculation already includes such efforts through a potentially smaller economic benefit amount, a shorter or less serious gravity component, or a lack of any recalcitrance. The Penalty Policy assumes all members of the regulated community will make good faith efforts both to achieve compliance and remedy violations when they occur; consequently the settlement penalty calculation begins at zero and builds upward, with no reductions for good faith. In contrast, the absence of good faith efforts provides the basis for increasing the penalty through use of the recalcitrance factor.

[18] The gravity calculation will reflect the lack of environmental harm. Courts have considered the extent of environmental harm associated with violations in determining the "seriousness of violations" pursuant to the factors in §309(d), and have used the absence of any demonstrated or discrete identified environmental harm to impose less than the statutory maximum penalty. Proof of environmental harm, however, is neither necessary for liability nor for the assessment of penalties.

[19] See, e.g., Natural Resources Defense Council v. Texaco Refining and Mktg., 800 F. Supp. 1, 24 (D. Del. 1992).

[20] See PIRG v. Powell Duffryn, 913 F. 2d 64, 80-81 (3rd Cir. 1990).

6. Approval of Litigation Considerations. The Agency recognizes that the quantitative evaluation of litigation considerations often reflects subjective legal opinions. Therefore, EPA Regions may reduce the preliminary penalty amount for litigation considerations for up to one-third of the net gravity amount (i.e., gravity as modified by the gravity adjustment factors) without Headquarters approval (where such approval would otherwise be required). Of course, such a reduction must be fully explained and maintained in the case file. This reduction is not applicable in municipal cases in which the tables in D.7 below are used.

7. Municipal Cases. In those cases against a municipality or other public entity (such as a sewer authority) in which the entity has failed to comply with the Clean Water Act but nevertheless did make good faith efforts to comply, the Agency may mitigate the preliminary penalty amount based on this national municipal litigation consideration. The preliminary penalty amount (economic benefit + gravity $\pm$ gravity adjustments) may be mitigated to no less than the cash penalty determined by operation of the two tables set forth below. In addition, the cash penalty amount established by the tables may be reduced based on compelling ability to pay considerations and by up to 40 percent for appropriate supplemental environmental projects. Reducing the cash penalty below the amount established by the national municipal litigation consideration (other than for ability to pay considerations or for 40 percent based on a SEP) requires compelling evidence of other considerations and the prior approval of Headquarters (even if Headquarters' approval of the settlement would otherwise not be required).

The national municipal litigation consideration is a discretionary factor and the Agency is under no obligation to use it in all municipal cases.[21] It should only be used if there is some evidence that the municipality made a good faith effort to comply. The national municipal litigation consideration is based on the economic benefit, environmental impact, duration and size of the facility, and is derived, in part, on the settlement penalties EPA has obtained from judicial municipal cases settled between October 1988 and December 1993. There are three steps to calculate a penalty using the national municipal litigation consideration tables.

1. Using Table A determine the economic benefit environmental impact factor amount. This dollar amount is found by selecting an appropriate value from the range in the appropriate cell in Table A. The economic benefit is the benefit previously calculated pursuant to section IV.A. above. Impact of the violations is based on the actual or potential (risk) of harm caused, in whole or part, by the violations.

2. Using Table B determine the population months of violations factor amount. This dollar amount is found by selecting an appropriate value from the range in the appropriate cell in Table B. The service population is the total population served by the violating

[21] The national municipal litigation consideration is primarily intended to apply in cases in which there has been a failure to timely construct treatment facilities or other capital projects; it may not be appropriate in pretreatment failure to implement cases.

POTW(s) during the period. The months of violation are the total number of months calculated pursuant to section IV.B above. (If the service population exceeds 3 million, the Table B value is found by combining values from multiple rows. For example, if the service population was 4.5 million, the factor B penalty contribution would be the sum of a value selected from the appropriate cell in the 1,000,001 to 2,000,000 population row plus a value selected from the appropriate cell in the 2,000,001 to 3,000,000 population row.)

3. Sum the selected factor values from Tables A and B. Note that the factor values in Tables A and B are in thousands of dollars.

NATIONAL MUNICIPAL LITIGATION CONSIDERATION -- TABLE A

ECONOMIC BENEFIT ENVIRONMENTAL IMPACT FACTOR IN THOUSANDS OF DOLLARS									
IMPACT OF VIOLATIONS ON HUMAN HEALTH OR THE ENVIRONMENT	**ECONOMIC BENEFIT RANGES IN THOUSANDS OF DOLLARS**								
	.001 to 50	50 to 100	100 to 250	250 to 1,000	1,000 to 2,000	2,000 to 5,000	5,000 to 10,000	10,000 to 25,000	greater than 25,000
No actual or potential harm.	6 to 9	11 to 15	17 to 23	32 to 43	49 to 67	75 to 103	110 to 151	167 to 230	283 to 389
Minor actual or potential harm (e.g., water quality-based effluent or whole effluent toxicity limit violated).	9 to 11	16 to 19	25 to 29	47 to 55	73 to 86	112 to 131	164 to 192	251 to 293	424 to 495
Moderate actual or potential harm (e.g., fish kill, beach closing, restrictions on use of water body, raw sewage discharges).	13 to 14	22 to 25	33 to 38	63 to 71	98 to 110	150 to 168	219 to 246	335 to 376	566 to 636
Severe actual or potential harm (e.g., repeated beach closings, interference with drinking water supplies).	17 to 32	30 to 55	46 to 84	87 to 158	135 to 245	206 to 374	301 to 548	460 to 837	778 to 1,414

NATIONAL MUNICIPAL LITIGATION CONSIDERATION -- TABLE B

POPULATION MONTHS OF VIOLATION FACTOR IN THOUSANDS OF DOLLARS

SERVICE POPULATION	MONTHS OF VIOLATION											
	1 to 6	7 to 12	13 to 18	19 to 24	25 to 30	31 to 36	37 to 42	43 to 48	49 to 54	55 to 60	61 to 66	66>
100 to 5,000	0 to 0.6	0 to 1.8	0.1 to 3	0.1 to 4.2	0.1 to 5.4	0.1 to 6.6	0.2 to 7.8	0.2 to 9	0.2 to 10.2	0.2 to 11.4	0.3 to 12.6	0.3 to 14
5,001 to 25,000	0.6 to 3	1.8 to 9	3 to 15	4.2 to 21	5.4 to 27	6.6 to 33	7.8 to 39	9 to 45	10.2 to 51	11.4 to 57	12.6 to 63	14 to 70
25,001 to 50,000	3 to 6	9 to 18	15 to 30	21 to 42	27 to 54	33 to 66	39 to 78	45 to 90	51 to 102	57 to 114	63 to 126	70 to 140
50,001 to 100,000	6 to 12	18 to 36	30 to 60	42 to 84	54 to 108	66 to 132	78 to 156	90 to 180	102 to 204	114 to 228	126 to 252	140 to 280
100,001 to 250,000	12 to 30	36 to 90	60 to 150	84 to 210	108 to 270	132 to 330	156 to 390	180 to 450	204 to 510	228 to 570	252 to 630	280 to 700
250,001 to 500,000	30 to 60	90 to 180	150 to 300	210 to 420	270 to 540	330 to 660	390 to 780	450 to 900	510 to 1,020	570 to 1,140	630 to 1,260	700 to 1,400
500,001 to 1,000,000	60 to 120	180 to 360	300 to 600	420 to 840	540 to 1,080	660 to 1,320	780 to 1,560	900 to 1,800	1,020 to 2,040	1,140 to 2,280	1,260 to 2,520	1,400 to 2,800
1,000,001 to 2,000,000	120 to 240	360 to 720	600 to 1,200	840 to 1,680	1,080 to 2,160	1,320 to 2,640	1,560 to 3,120	1,800 to 3,600	2,040 to 4,080	2,280 to 4,560	2,520 to 5,040	2,800 to 5,600
2,000,001 to 3,000,000	240 to 360	720 to 1,080	1,200 to 1,800	1,680 to 2,520	2,160 to 3,240	2,640 to 3,960	3,120 to 4,680	3,600 to 5,400	4,080 to 6,120	4,560 to 6,840	5,040 to 7,560	5,600 to 8,400

E. Ability to Pay (to decrease preliminary penalty amount)

The Agency typically does not request settlement penalties, which combined with the cost of the necessary injunctive relief, that are clearly beyond the financial capability of the violator. This means EPA should not seek a penalty that would seriously jeopardize the violator's ability to continue operations and achieve compliance, unless the violator's behavior has been exceptionally culpable, recalcitrant, threatening to human health or the environment, or the violator refuses to comply.

The adjustment for ability-to-pay may be used to reduce the settlement penalty to the highest amount that the violator can reasonably pay and still comply with the CWA. The violator has the primary burden of establishing the claim of inability to pay. The violator must submit the necessary information demonstrating actual inability to pay as opposed to unwillingness to pay. Further, the claim of inability to pay a penalty should not be confused with a violator's aversion to make certain adjustment in its operations in order to pay the penalty.[22]

If the violator is unwilling to cooperate in demonstrating its inability to pay the penalty, this adjustment should not be considered in the penalty calculation, because, without the cooperation of the violator, the Agency will generally not have adequate information to determine accurately the financial position of the violator. In some cases, the Agency may need to consult a financial expert to properly evaluate a violator's claim of inability to pay.

If the violator demonstrates an inability to pay the entire negotiated penalty in one lump sum (usually within 30 days of consent decree entry), a payment schedule should be considered. The penalty could be paid in scheduled installments with appropriate interest accruing on the delayed payments. The period allowed for such installment payments should generally not extend beyond three years.

If a payment schedule will not resolve the violator's ability-to-pay issue, as a last recourse, the Agency can reduce the amount it seeks in settlement to a more appropriate amount in situations in which inability-to-pay can be clearly documented and reasonably quantified.

In the case of municipalities, one quick way to evaluate whether there might be an ability to pay issue is to examine the most recent bond rating (within the past 5 years). If the bond rating is below BBB (Standard & Poor's rating scale) or below Baa (Moody's rating scale), the community may be in poor financial condition and a detailed financial evaluation by an appropriate expert may be necessary to determine whether the financial condition affects the ability to pay a penalty.

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[22] For example, a business may have to use funds that were previously designated to develop a new product line to pay a penalty and thus the new product line would be delayed. Similarly, a penalty could be paid using company funds that otherwise would have gone to pay its executives bonuses.

V. SUPPLEMENTAL ENVIRONMENTAL PROJECTS (SEPs)

Supplemental Environmental Projects (SEPs) are defined by EPA as environmentally beneficial projects which a violator undertakes, but is not otherwise legally required to perform, in exchange for favorable penalty consideration in settlement of an enforcement action. In order for a violator to receive a settlement penalty reduction in exchange for performing such a project, the project must conform with the EPA's SEP Policy, or be approved in advance by the Assistant Administrator[23]. A SEP may be allowed in a municipal case, even if the cash penalty is less than economic benefit, provided the cash penalty is no less than 60 percent of the amount provided in section IV.D.7. Use of SEPs in a particular case is entirely within the discretion of EPA, and the Department of Justice in judicial cases.

VI. OTHER TYPES OF PENALTIES

This Policy only establishes how the Agency expects to calculate the minimum penalty for which it would be willing to settle a case. The development of the penalty amount to plead in an administrative or judicial complaint is developed independent of this Policy. This Policy is not intended and should not be used as the basis for a penalty demand in a complaint, an administrative hearing or, a civil judicial trial. The Agency will not use this Penalty Policy in arguing for a penalty at trial or in an administrative penalty hearing.[24] In those cases which proceed to trial or an administrative hearing, the Agency should seek a penalty higher than that for which it is willing to settle.

If the "bottom-line" settlement penalty calculated pursuant to this Policy exceeds the maximum penalty that can be obtained in an administrative penalty action pursuant to §309(g) of the CWA, the Agency should instead proceed judicially.[25] In rare circumstances, the statutory maximum penalty may be less than the "bottom-line" settlement penalty in civil judicial cases; in such circumstances, the statutory maximum penalty should serve as the new "bottom-line" penalty.

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[23] See "EPA Policy on the Use of Supplemental Environmental Projects in Enforcement Settlements", transmitted on February 12, 1991 by the Assistant Administrator for Enforcement, or subsequent revisions.

[24] If that were to occur, then the defendant would have no incentive to settle with EPA. See *Guidance on the Distinctions Among Pleading, Negotiating, and Litigating Civil Penalties for Enforcement Cases Under the Clean Water Act,* OECM/OW, January 19, 1989.

[25] For further guidance on choosing between administrative and judicial enforcement options, see "Guidance on Choosing Among Clean Water Act Administrative, Civil and Criminal Enforcement Actions", which was Attachment 2 to the August 28, 1987 "Guidance Documents and Delegations for Implementation of Administrative Penalty Authorities Contained in 1987 Clean Water Act Amendments".

VII. DOCUMENTATION, APPROVALS, AND CONFIDENTIALITY

Each component of the settlement penalty calculation (including all adjustments and subsequent recalculations) must be clearly documented with supporting materials and written explanations in the case file. In all cases in which a settlement penalty may not comply with the provisions of this Policy, or in a case in which application of this Policy appears inappropriate, the penalty must be approved in advance by the EPA Assistant Administrator for Enforcement and Compliance Assurance.

Documentation and explanations of a particular settlement penalty calculation constitute confidential information that is exempt from disclosure under the Freedom of Information Act, is outside the scope of discovery, and is protected by various privileges, including the attorney-client privilege and the attorney work-product privilege. While individual settlement penalty calculations are confidential documents, this Policy is a public document and may be released to anyone upon request. Further, as part of settlement negotiations between the parties, the Agency may choose to release parts of the case-specific settlement calculations. The release of such information may only be used for settlement negotiations in the case at hand and, of course, may not be admitted into evidence in a trial or hearing. See Rule 408 of Federal Rules of Evidence.

This Policy is purely for the use of U.S. EPA enforcement personnel in settling cases. EPA reserves the right to change this Policy at any time, without prior notice, or to act at variance to this Policy. This Policy does not create any rights, implied or otherwise, in any third parties.

ATTACHMENT 1 TO INTERIM CWA SETTLEMENT PENALTY POLICY

EXAMPLES OF HOW TO CALCULATE STATUTORY MAXIMUM PENALTY

Violation scenario	Maximum statutory penalty*	Authority
Violation of daily maximum limit for pollutant A, on the 5th of January.	$25,000	Plain reading of CWA, § 309(d): "$25,000 per day for each violation"
Violation of daily maximum limit for pollutant A, on the 5th, 10th, and 15th of January.	$75,000	Plain reading of CWA, § 309(d): "$25,000 per day for each violation"
Violation of daily maximum limits for each of pollutants A and B, on the 5th of January.	$50,000	Tyson Foods and Powell Duffryn, as well as plain reading of CWA, § 309(d): "$25,000 per day for each violation"
Violation in January of weekly average for pollutant A.	$25,000 per day, multiplied by 7 days $175,000.	Tyson Foods, 897 F.2d at 1139. Also see, Gwaltney, 897 F. 2d at 314.
Violation in January of monthly average limit for pollutant A.	$25,000 per day, multiplied by 31 days in January = $775,000	Tyson Foods, 897 F.2d at 1139. Also see, Gwaltney, 897 F. 2d at 314.
Violation in January of monthly average limit for pollutant A, in which there is evidence that there were no discharges on 4 days (e.g. plant shut down on Sundays).	$25,000 per day, multiplied by 27 days in January = $675,000	Natural Resources Defense Council v. Texaco , 2 F.3d 493, 507-508 (3rd Cir. 1993).
Violation in January of monthly average limits for both pollutants A and B.	$50,000 per day, multiplied by 31 days in January, = $1,550,000	Tyson Foods, 897 F.2d at 1140, footnote 22
Violation in January of monthly average limit for pollutant A, and of daily maximum limit for pollutant B on January 5th and 15th.	$775,000 for pollutant A, + $50,000 ($25,000 per day x 2) for pollutant B, = $825,000	Tyson Foods, 897 F.2d at 1140, under "The interaction of daily and monthly violations"
Violation in January of monthly average limit for pollutant A, and of daily maximum limit for pollutant A on Jan. 5th and 15th.	25,000 per day, multiplied by 31 days in January, = $775,000.	Tyson Foods, 897 F.2d at 1140, under "The interaction of daily and monthly violations"
Failure to properly monitor ** for pollutant A on 4 required days in January.	$100,000.	Statutory language, CWA §309.

Violation scenario	Maximum statutory penalty*	Authority
Failure to properly monitor for pollutants A, B, and C on January 15.	$75,000.	Statutory language, CWA §309.
Failure to monitor for a monthly pollutant parameter.	$25,000 for each day in which the discharger was required to monitor for that pollutant.	Statutory language, CWA §309.
Failure to submit adequate discharge monitoring report on time (each failure to monitor for a particular pollutant is subject to a separate penalty calculation).	$25,000.	Statutory language, CWA §309.
Failure to timely submit a report or other document (each failure to timely complete an activity covered by the report is subject to a separate penalty calculation).	$25,000	Settlement policy discretion.

NOTES:

* For administrative penalty cases the penalty per day for each violation is $10,000 and may not exceed the total penalty amount allowed in a Class I or Class II administrative proceeding.

** For purposes of calculating penalties, the act of monitoring for a particular pollutant includes the sequence of events starting with the collection of the wastewater sample through completion of the analytical testing of the sample. The obligation to report the results of the monitoring is a separate act subject to a separate penalty calculation.

The guidelines set forth here reflect EPA's policy on how to calculate the statutory maximum penalty with regards to ensuring that all settlement penalties sought pursuant to the Penalty Policy do not exceed such statutory maximum. At trial or in a hearing, EPA reserves the right to calculate the statutory maximum pursuant to more aggressive assumptions.

ATTACHMENT 2 TO INTERIM CWA SETTLEMENT PENALTY POLICY

Case Name_____ Date_____

Prepared by _____ and _____ [attorney name].

SETTLEMENT PENALTY CALCULATION WORKSHEET

	STEP	AMOUNT
1.	Calculate Statutory Maximum Penalty (period of violations from _____ through _____)	
2.	Economic Benefit (attach BEN printouts, with explanations for calculations)	
3.	Total of Monthly Gravity Amounts	
4.	Economic Benefit + Gravity (lines 2 + 3)	
5.	Gravity Adjustments	
	a. Flow Reduction Factor ___ (0 to 50%) X line 3	
	b. Recalcitrance Factor ___ (0 to 150%) X line 3	
	c. Quick Settlement Reduction __ (0 or 10%) X line 3	
	d. Total gravity adjustments (negative amount if net gravity reduction) (lines 5.b. - 5.c - 5.a)	
6.	Preliminary Penalty Amount (lines 4 + 5.d)	
7.	Litigation Consideration Reduction (if any)	
8.	Ability to pay reduction (if any)	
9.	Reduction for Supplemental Environmental Projects (if any)	
10.	**Bottom-line Cash Settlement Penalty** (Line 6 less lines 7, 8 and 9. Or, if applicable, amount calculated by national municipal litigation consideration in §IV.D.6, less no more than 40% of that amount for appropriate SEPs.)	

United States Government Accountability Office

GAO

Testimony

Before the Committee on Environment and Public Works, U. S. Senate

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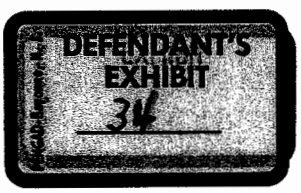
ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT

EPA's Effort to Improve and Make More Consistent Its Compliance and Enforcement Activities

Statement of John B. Stephenson,
Director, Natural Resources and Environment



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Highlights

Highlights of GAO-06-840T, testimony before the Committee on Environment and Public Works, U.S. Senate

June 2006

ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT

EPA's Efforts to Improve and Make More Consistent Its Compliance and Enforcement Activities

Why GAO Did This Study

The Environmental Protection Agency (EPA) enforces the nation's environmental laws and regulations through its Office of Enforcement and Compliance Assurance (OECA). While OECA provides overall direction on enforcement policies and occasionally takes direct enforcement action, many enforcement responsibilities are carried out by EPA's 10 regional offices. In addition, these offices oversee the enforcement programs of state agencies that have been delegated the authority to enforce federal environmental protection regulations.

This testimony is based on GAO's reports on EPA's enforcement activities issued over the past several years and on observations from ongoing work that is being performed at the request of this Committee and the Subcommittee on Interior, Environment and Related Agencies, House Committee on Appropriations. GAO's previous reports examined the (1) consistency among EPA regions in carrying out enforcement activities, (2) factors that contribute to any inconsistency, and (3) EPA's actions to address these factors. Our current work examines how EPA, in consultation with regions and states, sets priorities for compliance and enforcement and how the agency and states determine respective compliance and enforcement roles and responsibilities and allocate resources for these purposes.

www.gao.gov/cgi-bin/getrpt?GAO-06-840T

To view the full product, click on the link above.
For more information, contact John B. Stephenson at (202) 512-3841 or stephensonj@gao.gov.

What GAO Found

EPA regions vary substantially in the actions they take to enforce environmental requirements, according to GAO's analysis of key management indicators that EPA headquarters uses to monitor regional performance. These indicators include the number of inspections performed at regulated facilities and the amount of penalties assessed for noncompliance with environmental regulations. In addition, the regions differ substantially in their overall strategies to oversee states within their jurisdictions. For example, contrary to EPA policy, some regions did not require states to report all significant violators, while other regions adhered to EPA's policy in this regard.

GAO identified several factors that contribute to regional variations in enforcement. These factors include (1) differences in philosophy among regional enforcement staff about how best to secure compliance with environmental requirements; (2) incomplete and unreliable enforcement data that impede EPA's ability to accurately determine the extent to which variations occur; and (3) an antiquated workforce planning and allocation system that is not adequate for deploying staff in a manner to ensure consistency and effectiveness in enforcing environmental requirements.

EPA recognizes that while some variation in environmental enforcement is necessary to reflect local conditions, core enforcement requirements must be consistently implemented to ensure fairness and equitable treatment. Consequently, similar violations should be met with similar enforcement responses regardless of geographic location. In response to GAO findings and recommendations, EPA has initiated or planned several long-term actions that are intended to achieve greater consistency in state and regional enforcement actions. These include (1) a new State Review Framework process for measuring states' performance of core enforcement activities, (2) a number of initiatives to improve the agency's compliance and enforcement data, and (3) enhancements to the agency's workforce planning and allocation system to improve the agency's ability to match its staff and technical capabilities with the needs of individual regions. However, these actions have yet to achieve significant results and will likely require a number of years and a steady top-level commitment of staff and financial resources to substantially improve EPA's ability to target enforcement actions in a consistent and equitable manner.

Mr. Chairman and Members of the Committee:

I am pleased to be here today to discuss our work on the Environmental Protection Agency's (EPA) difficulties in ensuring consistent and equitable enforcement actions among its regions and among the states. Our testimony today is based on reports we have issued on EPA's compliance and enforcement activities over the past several years,[1] and provides some observations from the ongoing work that we are performing at your request and that of the Subcommittee on Interior, Environment and Related Agencies, House Committee on Appropriations. As you know, we are assessing how EPA, in consultation with regions and state agencies, sets priorities for compliance and enforcement and how the agency and the states determine respective compliance and enforcement roles and responsibilities and allocate resources for these purposes. As part of this effort, we are assessing EPA's initiated and planned actions to address key factors that result in inconsistencies—identified in our previous work—in carrying out its enforcement responsibilities. We expect to complete this ongoing review on EPA and state enforcement and issue our report in March 2007.

EPA seeks to achieve cleaner air, purer water, and better protected land in many different ways. Compliance with the nation's environmental laws is the goal, and enforcement is a vital part of the effort to encourage state and local governments, companies, and others who are regulated to meet their environmental obligations. Enforcement deters those who might otherwise seek to profit from violating the law, and levels the playing field for environmentally compliant companies.

EPA administers its environmental enforcement responsibilities through its Office of Enforcement and Compliance Assurance (OECA). While OECA provides overall direction on enforcement policies, and occasionally takes direct enforcement action, many of its enforcement responsibilities are carried out by its 10 regional offices (regions). These regions, in addition to taking direct enforcement action, oversee the

[1]See GAO, *Environmental Protection: More Consistency Needed Among EPA Regions in Approach to Enforcement*, GAO/RCED-00-108 (Washington, D.C.: June 2, 2000); *Human Capital: Implementing an Effective Workforce Strategy Would Help EPA to Achieve Its Strategic Goals*, GAO-01-812 (Washington, D.C.: July 31, 2001); and *Clean Water Act: Improved Resource Planning Would Help EPA Better Respond to Changing Needs and Fiscal Constraints*, GAO-05-721 (Washington, D.C.: July 22, 2005).

enforcement programs of state agencies that have been delegated authority for enforcing federal environmental protection requirements.[2]

In my testimony today, I will describe the (1) extent to which variations exist among EPA's regions in enforcing environmental requirements, (2) key factors that contribute to any such variations, and (3) status of the agency's efforts to address these factors.

In summary, as we previously reported on regional efforts to enforce provisions of the Clean Water Act and the Clean Air Act, the regions vary substantially in the actions they take to enforce environmental requirements. These variations show up in key management indicators that EPA headquarters officials have used to monitor regional performance, such as the number of inspections performed at regulated facilities and the amount of penalties assessed for noncompliance with environmental regulations. For example, in fiscal year 2000, the number of inspections conducted under the Clean Air Act compared with the number of facilities in each region subject to EPA's inspection under the act varied from a high of 80 percent in Region 3 to a low of 27 percent in Regions 1 and 2.

We also reported that it is important to understand the reasons for some of these variations, such as a regional determination to conduct more in-depth inspections at a fewer number of facilities instead of conducting less intensive examinations at many more facilities. Accordingly, we recommended that EPA clarify which enforcement actions it expects to see consistently implemented across the regions and direct the regions to supplement its reporting with information that helps explain why variation occurred. We did not focus our work on the effects of inconsistent enforcement on various types of businesses, including small businesses, the particular focus of the Committee's hearing today. However, in performing our work we noted that a recent study for the Small Business Administration,[3] as well as other studies, have suggested that environmental requirements fall most heavily on small businesses. To the

[2]For many federal environmental programs, EPA either authorizes states to administer the federal program or retains authority to administer the program for the state. The state programs that have been approved by EPA are described as "delegated" in this testimony for clarity and consistency with EPA program terminology.

[3]W. Mark Crain, *The Impact of Regulatory Costs on Small Firms*, a report prepared at the request of the Small Business Administration's Office of Advocacy (Washington, D.C., September 2005).

extent that this is the case, small businesses could be especially disadvantaged by any inconsistencies and inequities in EPA's enforcement approach. EPA has made progress toward resolving challenges in its enforcement activities that we have previously identified. Nonetheless, each of the challenges is complex and will require much more work and continued vigilance to overcome.

Our work has identified several factors contributing to regional variations: (1) differences in the philosophy of enforcement staff about how to best achieve compliance with environmental requirements; (2) incomplete and inadequate enforcement data, which hamper EPA's ability to accurately determine the extent of variations; and (3) an antiquated workforce planning and allocation system that is not adequate for deploying staff to ensure greater consistency and effectiveness in enforcing environmental requirements.

Finally, EPA recognizes that to ensure fair and equitable treatment, core enforcement requirements must be consistently implemented so that similar violations are met with similar enforcement responses, regardless of geographic location. Accordingly, and in response to our findings and recommendations, the agency has initiated or planned actions that are intended to achieve greater consistency in regional and state enforcement activities. These actions include the following:

- *Developing the State Review Framework.* This framework involves a new process for conducting reviews and measuring the performance of core enforcement programs in states with delegated authority (as well as nondelegated programs implemented by EPA regions). Although the process is a promising means for ensuring more consistent enforcement actions, it is too early to assess whether the process will result in more consistent enforcement actions and a level playing field for the regulated community across the nation.

- *Improving management information.* EPA has a number of ongoing activities to improve the agency's enforcement data, but the data problems are long-standing and complex. It will likely require a number of years and a steady top-level commitment of staff and financial resources to substantially improve the data so that they can be effectively used to target enforcement actions in a consistent and equitable manner.

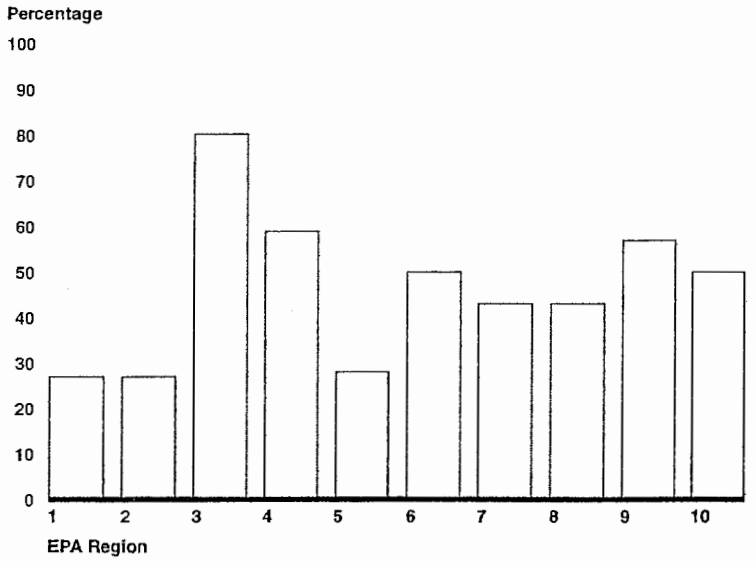
- *Enhancing workforce planning and allocation.* For the past several years, EPA has taken measures to improve its ability to match its staff and technical capabilities with the needs of individual regions and states. For

example, EPA developed a human capital strategy and performed a study of its workforce competencies. Nonetheless, the agency still needs to determine how to deploy its employees among its strategic goals and geographic locations so that it can most effectively use its resources, including its compliance and enforcement resources.

Regional Enforcement Activities Vary Substantially

EPA's enforcement program depends heavily upon inspections by regional or state enforcement staff as the primary means of detecting violations and evaluating overall facility compliance. Thus, the quality and the content of the agency's and states' inspections, and the number of inspections undertaken to ensure adequate coverage, are important indicators of the enforcement program's effectiveness. However, as we reported in 2000, EPA's regional offices varied substantially on the actions they take to enforce the Clean Water Act and Clean Air Act. Consistent with earlier observations of EPA's Office of Inspector General and internal agency studies, we found these variations in regional actions reflected in the (1) number of inspections EPA and state enforcement personnel conducted at facilities discharging pollutants within a region, (2) number and type of enforcement actions taken, and (3) the size of the penalties assessed and the criteria used in determining the penalties assessed. For example, as figure 1 indicates, the number of inspections conducted under the Clean Air Act in fiscal year 2000 compared with the number of facilities in each region subject to EPA's inspection under the act varied from a high of 80 percent in Region 3 to a low of 27 percent in Regions 1 and 2.

Figure 1: Percentage of Total Regulated Facilities Inspected Under the Clean Air Act During Fiscal Year 2000, by EPA Region



Source: GAO's analysis of EPA data.

While the variations in enforcement raise questions about the need for greater consistency, it is also important to get behind the data to understand the cause of the variations and the extent to which they reflect a problem. For example, EPA attributed the low number of inspections by its Region 5, in Chicago, to the regional office's decision at the time to focus limited resources on performing detailed and resource-intensive investigations of the region's numerous electric power plants, rather than conducting a greater number of less intensive inspections.

We agree that regional data can be easily misinterpreted without the contextual information needed to clarify whether variation in a given instance is inappropriate or whether it reflects the appropriate exercise of flexibility by regions and states to tailor their priorities to their individual needs and circumstances. In this regard, we recommended that it would be appropriate for EPA to (1) clarify which aspects of the enforcement program it expects to see implemented consistently from region to region and which aspects may appropriately be subject to greater variation and (2) supplement region-by-region data with contextual information that helps to explain why variations occur and thereby clarify the extent to which variations are problematic.

Our findings were also consistent with the findings of EPA's Inspector General and OECA that regions vary in the way they oversee state-delegated programs. In this regard, contrary to EPA policy, some regions did not (1) conduct an adequate number of oversight inspections of state programs, (2) sufficiently encourage states to consider economic benefit in calculating penalties, (3) take more direct federal actions where states were slow to act, and (4) require states to report all significant violators. Regional and state officials generally indicated that it was difficult for them to ascertain the extent of variation in regional enforcement activities, given their focus on activities within their own geographic environment. However, EPA headquarters officials responsible for the air and water programs noted that such variation is fairly commonplace and does pose problems. The director of OECA's water enforcement division, for example, told us that, in reacting to similar violations, enforcement responses in certain regions are stronger than they are in others and that such inconsistencies have increased.

Similarly, the director of OECA's air enforcement division said that, given the considerable autonomy of the regional offices, it is not surprising that variations exist in how they approach enforcement and state oversight. In this regard, the director noted, disparities exist among regions in the number and quality of inspections conducted and in the number of permits written in relation to the number of sources requiring permits.

In response to these findings, a number of regions have begun to develop and implement state audit protocols, believing that having such protocols could help them review the state programs within their jurisdiction with greater consistency. Here, too, regional approaches differ. For example:

- Region 1, in Boston, has adopted a comprehensive "multimedia" approach in which it simultaneously audits all of a state's delegated environmental programs.
- Region 3, in Philadelphia, favors a more targeted approach in which air, water, and waste programs are audited individually.
- In Region 5, in Chicago, the office's air enforcement branch chief said that he did not view an audit protocol as particularly useful, noting that he prefers regional staff to engage in joint inspections with states to assess the states' performance in the field and to take direct federal action when a state action is inadequate.

We recognize the potential of these protocols to achieve greater consistency by a region in its oversight of its states, and the need to tailor such protocols to meet regional concerns. However, we also believe that EPA guidance on key elements that should be common to all protocols would help engender a higher level of consistency among all 10 regions in how they oversee states.

Several Factors Contribute to Variations in Regional Enforcement Programs

While EPA's data show variations in key measures associated with the agency's enforcement program, they do little to explain the causes of the variations. Without information on causes, it is difficult to determine the extent to which variations represent a problem, are preventable, or reflect appropriate regional and state flexibility in applying national program goals to unique circumstances. Our work identified the following causes: (1) differences in philosophical approaches to enforcement, (2) incomplete and inaccurate national enforcement data, and (3) an antiquated workforce planning and allocation system.

Regions Differ in Their Philosophical Approaches to Enforcement

While OECA has issued policies, memorandums, and other documents to guide regions in their approach to enforcement, the considerable autonomy built into EPA's decentralized, multilevel organizational structure allows regional offices considerable latitude in adapting headquarters' direction in a way they believe best suits their jurisdiction. The variations we identified often reflect different enforcement approaches in determining whether the region should (1) rely predominantly on fines and other traditional enforcement methods to deter noncompliance and to bring violators into compliance or (2) place greater reliance on alternative strategies, such as compliance assistance (workshops, site visits, and other activities to identify and resolve potential compliance problems). Regions have also differed on whether deterrence could be achieved best through a small number of high-profile, resource-intensive cases or a larger number of smaller cases that establish a more widespread, albeit lower profile, enforcement presence. Further complicating matters are the wide differences among states in their enforcement approaches and the various ways in which regions respond to these differences. Some regions step more readily into cases when they consider a state's action to be inadequate, while other regions are more concerned about infringing on the discretion of states that have been delegated enforcement responsibilities. While all of these approaches may be permissible, EPA has experienced problems in identifying and communicating the extent to which variation either represents a problem

or the appropriate exercise of flexibility by regions and states to apply national program goals to their unique circumstances.

National Enforcement Data Are Incomplete and Inaccurate

OECA needs accurate and complete enforcement data to determine whether regions and states are consistently implementing core program requirements and, if not, whether significant variations in meeting these requirements should be corrected. The region or the state responsible for carrying out the enforcement program is responsible for entering data into EPA's national databases. However, both the quality of and quality controls over these data were criticized by state and regional staff we interviewed.

Internal OECA studies have also acknowledged the seriousness of the data problem. An OECA work group, the "Targeting Program Review Team," stated that key functions related to data quality, such as the consistent entry of information by regions and states, were not working properly and that there were important information gaps in EPA's enforcement-related databases. Another OECA work group concluded in 2006, "OECA managers do not have available to them timely, complete, and detailed analyses of regional or national performance." A third OECA work group asserted that the situation has deteriorated from past years, noting:

> "managers in the regions and in OECA headquarters have become increasingly frustrated that they are not receiving from [the Office of Compliance] the reports and data analyses they need to manage their programs...[and there] has been less attention to the data in the national systems, a commensurate decline in data quality, and insufficient use of data by enforcement/compliance managers."

Consistent with our findings and recommendations, EPA's Office of Inspector General recently reported that, "OECA's 2005 publicly-reported GPRA [Government Performance and Results Act] performance measures do not effectively characterize changes in compliance or other outcomes because OECA lacks reliable compliance rates and other reliable outcome data. In the absence of compliance rates, OECA reports proxies for compliance to the public and does not know if compliance is actually going up or down. As a result, OECA does not have all the data it needs to make management and program decisions. What is missing most, the biggest gap, is information about compliance rates. OECA cannot demonstrate the reliability of other measures because it has not verified that estimated, predicted, or facility self-reported outcomes actually took place. Some measures do not clearly link to OECA's strategic goals. Finally, OECA frequently changed its performance measures from year to

year, which reduced transparency." For example, between fiscal years 1999-2005, OECA reported on a low of 23 performance measures to a high of 69 measures, depending on the fiscal year.

Although EPA is working to improve its data, the problems are extensive and complex. For example, the Inspector General recently reported that OECA cannot generate programmatic compliance information for five of six program areas; lacks knowledge of the number, location, and levels of compliance for a significant portion of its regulated universe; and concentrates most of its regulatory activities on large entities and knows little about the identities or cumulative impact of small entities. Consequently, the Inspector General reported, OECA currently cannot develop programmatic compliance information, adequately report on the size of the universe for which it maintains responsibility, or rely on the regulated universe data to assess the effectiveness of enforcement strategies.[4]

EPA's Workforce Planning and Allocation System Is Not Adequate for Effectively Deploying Staff to Regions

As we reported, EPA's process for budgeting and allocating resources does not fully consider the agency's current workload, either for specific statutory requirements, such as those included in the Clean Water Act, or for broader goals and objectives in the agency's strategic plan. Instead, in preparing its requests for funding and staffing, EPA makes incremental adjustments, largely based on historical precedents, and thus its process does not reflect a bottom-up review of the nature or distribution of the current workload. While EPA has initiated several projects over the past decade to improve its workload and workforce assessment systems, it continues to face major challenges in this area

If EPA is to substantially improve its resource planning, we reported, it must adopt a more rigorous and systematic process for (1) obtaining reliable data on key workload indicators, such as the quality of water in particular areas, which can be used to budget and allocate resources, and (2) designing budget and cost accounting systems that are able to isolate the resources needed and allocated to key enforcement activities.

[4]EPA Office of Inspector General, *Limited Knowledge of the Universe of Regulated Entities Impedes EPA's Ability to Demonstrate Changes in Regulatory Compliance*, Report No. 2005-P-00024, September 19, 2005.

Without reliable workforce information, EPA cannot ensure consistency in its enforcement activities by hiring the right number or type of staff or allocating existing staff resources to meet current or future needs. In this regard, since 1990, EPA has hired thousands of employees without systematically considering the workforce impact of changes in environmental statutes and regulations, technological advances in affecting the skills and expertise needed to conduct enforcement actions, or the expansion in state environmental staff. EPA has yet to factor these workforce changes into its allocation of existing staff resources to its headquarters and regional offices to meet its strategic goals. Consequently, should EPA either downsize or increase its enforcement and compliance staff, it would not have the information needed to determine how many employees are appropriate, what technical skills they must have, and how best to allocate employees among strategic goals and geographic locations in order to ensure that reductions or increases could be absorbed with minimal adverse impacts in carrying out the agency's mission.

EPA Has Initiated or Planned Actions to Achieve Greater Consistency in Enforcement Activities

Over the past several years, EPA has initiated or planned several actions to improve its enforcement program. We believe that a few of these actions hold particular promise for addressing inconsistencies in regional enforcement activities. These actions include (1) the creation of a State Review Framework, (2) improvements in the quality of enforcement data, and (3) enhancements to the agency's workforce planning and allocation system.

EPA's State Review Framework Holds Promise, but It Is Too Early to Assess Its Effectiveness

The State Review Framework is a new process for conducting performance reviews of enforcement and compliance activities in the states (as well as for nondelegated programs implemented by EPA regions). These reviews are intended to provide a mechanism by which EPA can ensure a consistent level of environmental and public health protection across the country. OECA is in the second year of a 3-year project to make State Review Framework reviews an integral part of the regional and state oversight and planning process and to integrate any regional or state corrective or follow-up actions into working agreements between headquarters, regions, and states. It is too early to assess whether the process will provide an effective means for ensuring more consistent enforcement actions and oversight of state programs to help ensure a level playing field for the regulated community across the country. Issues that still need to be addressed include how EPA will assess states'

implementation of alternative enforcement and compliance strategies, such as strategies to assist businesses in their efforts to comply with environmental regulations; encourage businesses to take steps to reduce pollution; offer incentives (e.g., public recognition) for businesses that demonstrate good records of compliance; and encourage businesses to participate in programs to audit their environmental performance and make the results of these audits and corrective actions available to EPA, other environmental regulators, and the public.

Efforts Are Underway to Improve Data, but Critical Gaps Remain

Regardless of other improvements EPA makes to the enforcement program, it needs to have sufficient environmental data to measure changes in environmental conditions, assess the effectiveness of the program, and make decisions about resource allocations. Through its Environmental Indicators Initiative and other efforts, EPA has made some progress in addressing critical data gaps in the agency's environmental information. However, the agency still has a long way to go in obtaining the data it needs to manage for environmental results and needs to work with its state and other partners to build on its efforts to fill critical gaps in environmental data. Filling such gaps in EPA's knowledge of environmental conditions and trends should, in turn, translate into better approaches in allocating funds to achieve desired environmental results. Such knowledge will be useful in making future decisions related to strategic planning, resource allocations, and program management.

Nevertheless, most of the performance measures that EPA and the states are still using focus on outputs rather than on results, such as the number of environmental pollution permits issued, the number of environmental standards established, and the number of facilities inspected. These types of measures can provide important information for EPA and state managers to use in managing their programs, but they do not reflect the actual environmental outcomes that EPA must know in order to ensure that resources are being allocated in the most cost-effective ways to improve environmental conditions and public health.

EPA also has worked with the states and regional offices to improve enforcement data in its Permit Compliance System and believes that its efforts have improved data quality. EPA officials said that the system will be incorporated into the Integrated Compliance Information System, which is being phased in this year. According to information EPA provided, the modernization effort will identify the data elements to be entered and maintained by the states and regions and will include additional data entry for minor facilities and special regulatory program

areas, such as concentrated animal feeding operations, combined sewer overflows, and storm water. Regarding the National Water Quality Inventory, the Office of Water recently began advocating the use of standardized, probability-based, statistical surveys of state waters so that water quality information would be comparable among states and from year-to-year.

While these efforts are steps in the right direction, progress in this area has been slow and the benefits of initiatives currently in the discussion or planning stages are likely to be years away from realization. For example, initiatives to improve EPA's ability to manage for environmental results are essentially long-term. They will require a long-term commitment of management attention, follow-through, and support—including the dedication of appropriate and sufficient resources—for their potential to be fully realized. A number of similar initiatives in the past have been short-lived and unproductive in terms of lasting contributions to improved performance management. The ultimate payoff will depend on how fully EPA's organization and management support these initiatives and the extent to which identified needs are addressed in a determined, systematic, and sustained fashion over the next several years.

EPA Has Improved the Management of its Human Capital System, but Challenges Remain in Allocating Staff to Match Enforcement Requirements in its Regions

Since the late 1990s, EPA has made progress in improving the management of its human capital. EPA's human capital strategic plan was designed to ensure a systematic process for identifying the agency's human capital requirements to meet strategic goals. Furthermore, EPA's strategic planning includes a cross-goal strategy to link strategic planning efforts to the agency's human capital strategy. Despite such progress, effectively implementing a human capital strategic plan remains a major challenge. Consequently, the agency needs to continue monitoring progress in developing a system that will ensure a well-trained and motivated workforce with the right mix of skills and experience. In this regard, the agency still has not taken the actions that we recommended in July 2001 to comprehensively assess its workforce—how many employees it needs to accomplish its mission, what and where technical skills are required, and how best to allocate employees among EPA's strategic goals and geographic locations. Furthermore, as previously mentioned, EPA's process for budgeting and allocating resources does not fully consider the agency's current workload. With prior years' allocations as the baseline, year-to-year changes are marginal and occur in response to (1) direction from the Office of Management and Budget and the Congress, (2) spending caps imposed by EPA's Office of the Chief Financial Officer, and (3) priorities negotiated by senior agency managers.

EPA's program offices and regions have some flexibility in realigning resources based on their actual workload, but the overall impact of these changes is also minor, according to agency officials. Changes at the margin may not be sufficient because both the nature and distribution of the workload have changed as the scope of activities regulated has increased and as EPA has taken on new responsibilities while shifting others to the states. For example, controls over pollution from storm water and animal waste at concentrated feeding operations have increased the number of regulated entities by hundreds of thousands and required more resources in some regions of the country. However, EPA may be unable to respond effectively to changing needs and constrained resources because it does not have a system in place to conduct periodic "bottom-up" assessments of the work that needs to be done, the distribution of the workload, or the staff and other resource needs.

Mr. Chairman, to its credit, EPA has initiated a number of actions to improve its enforcement activities and has invested considerable time and resources to make these activities more effective and efficient. While we applaud EPA's actions, they have thus far achieved only limited success and illustrate both the importance and the difficulty of addressing the long-standing problems in ensuring the consistent application of enforcement requirements, fines and penalties for violations of requirements, and the oversight of state environmental programs. To finish the job, EPA must remain committed to continuing the steps that it has already taken. In this regard, given the difficulties of the improvements that EPA is attempting to make and the time likely to be required to achieve them, it is important that the agency remain vigilant. It needs to guard against any erosion of its efforts by factors that have hampered past efforts to improve its operations, such as changes in top management and priorities and constraints on available resources.

Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions that you or Members of the Committee may have.

Contact and Staff Acknowledgments

If you have any questions about this testimony, please contact me at (202) 512-3841 or stephensonj@gao.gov. Major contributors to this testimony include Ed Kratzer, John C. Smith, Ralph Lowry, Ignacio Yanes, Kevin Bray, and Carol Herrnstadt Shulman.

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News

Enforcement
EPA Regional, State Actions Inconsistent; More Uniformity Needed, Senate Panel Told

Enforcement across the Environmental Protection Agency's regional offices and the states varies significantly and should be more uniform, a Government Accountability Office official told a Senate committee June 28.

EPA's 10 regional offices and the 50 U.S. states vary considerably in the number of inspections they make at facilities discharging pollutants, the number and type of enforcement actions, and the size of the penalties assessed, said John Stephenson, director of GAO's Natural Resources and Environment Division.

Reasons for these inconsistencies range from "differences in philosophy" among regional staff, incomplete and unreliable enforcement data, and inadequate planning for deploying staff, Stephenson told a hearing of the Senate Environment and Public Works Committee.

Although EPA has recently taken some measures to improve its enforcement consistency, significant improvement will require years of a "steady, top-level commitment of staff and financial resources," he said.

GAO's findings appear in *Environmental Compliance and Enforcement: EPA's Efforts to Improve and Make More Consistent Its Compliance and Enforcement Activities*, released at the hearing.

Sen. James Inhofe (R-Okla.), committee chair, said EPA's 10 regions, each directed by an administrator overseeing about 1,000 employees, results in "10 different sets of rules for the regulated communities throughout the country."

"Because of this design, EPA regions are notoriously autonomous and have been known to advance their own agendas," Inhofe said.

EPA Says Flexibility Needed

Granta Nakayama, EPA assistant administrator for enforcement and compliance assurance, told the hearing the agency does not condone enforcement activity that is arbitrary, that differs vastly depending on the location, or that "springs from animosity" toward an individual or a company.

That said, EPA must have flexibility to take individual cases into account for effective and consistent enforcement, he said.

Moreover, differences in enforcement responses do not necessarily equate to disparities, according to Nakayama. An action that appears to be a disparity in EPA's response to a violation could simply reflect the facts and circumstances of a particular case, he said.

"If disparities exist, we are committed to removing them, while retaining the flexibility we need to address differences," he said.

To ensure consistency in both state and regional oversight, EPA is implementing the State Review Framework, developed by EPA and the Environmental Council of States, he said. The framework uses existing program guidance to evaluate state performance and help EPA determine the adequacy of a state's program, he said.

Finally, consistency in environmental protection depends heavily on good data, and EPA has invested heavily in modernizing its data systems, Nakayama said.

A March report by EPA's inspector general identified several weaknesses in EPA's enforcement office information systems it said could affect their operations, assets, and personnel (62 DEN A-4, 3/31/06)

Region 5 Called 'Renegade.'

Inhofe said he convened the hearing, in part, because of several recent examples in Region 5, which he called a "renegade region whose interpretation of laws is not only contrary to national practice and standards but has been openly questioned by Congress" and the courts. Region 5 is headquartered in Chicago.

In one example cited by the Illinois Fertilizer & Chemical Association, a pesticide applicator for Wabash Valley, a farmer-owned co-op, faced jail time for problems related to the drift of pesticide spray.

"This is the first time that we know of that U.S. EPA has filed criminal charges against an agricultural retailer and its employees" for allegedly allowing pesticide spray to drift, Jean Payne, representing the Illinois chemical group, told the hearing.

Although a federal judge in the U.S. District Court for the Southern District of Illinois recently threw out the case, questioning the government's judgment in filing it, Wabash had already spent more than $220,000 defending itself, she said.

A second example concerns Region 5 enforcement actions against the nearly 500 Illinois retailers that store anhydrous ammonia as nitrogen fertilizer. In 2002, the region began inspecting the firms to determine compliance with the Clean Air Act, Payne said.

Conflicting Guidance Alleged

The region offered conflicting guidance on compliance requirements and was unresponsive to industry's attempts to obtain more information, she said.

With little warning, in December 2005 Region 5 determined that over 90 percent of the 500 facilities were in violation of the Clean Air Act for failing to submit adequate risk management plans and could be fined up to $32,000 per day per facility, she said.

Over time, and with "constant appeals," the companies were able to avoid monetary penalties and consent decrees, she said.

Region 5 officials could not be reached for comment.

In his testimony before the committee, Eric Schaeffer, director of the Environmental Integrity Project, said "there are no silver bullets," but that some actions could lead to enforcement improvements.

Both EPA and state agencies need more staffing, and permit fees are a more reliable source

of funding than annual congressional appropriations, he said. He also recommended requiring the major polluters to use state-of-the-art monitoring to track emissions, instead of what he called the inaccurate accounting procedures still in use at many facilities.

Schaeffer also said, "Unfortunately, there is no substitute for regular oversight of state programs, and this is probably EPA's toughest job."

However, the "biggest problem by far," Schaeffer said, "is the lack of any meaningful environmental enforcement at all in some of the most heavily polluted parts of our country."

The GAO report, Environmental Compliance and Enforcement: EPA's Efforts to Improve and Make More Consistent Its Compliance and Enforcement Activities, is available at http://www.gao.gov/cgi-bin/getrpt?GAO-06-840T.

By Patricia Ware

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

BEFORE THE ADMINISTRATOR

IN THE MATTER OF	)	
	)	
CITY OF MARSHALL,	)	**Docket No. CWA-5-98-013**
	)	
Respondent	)	

Initial Decision

Introduction

In this administrative complaint brought under Section 309(g) of the Clean Water Act ("CWA" or "Act"), EPA has alleged that the City of Marshall (the "City") in connection with its operation of a wastewater treatment plant, violated the CWA during the application of sewage sludge to agricultural land. According to EPA, the sludge violated the Act in two respects: it had excess levels of molybdenum and an insufficient reduction of disease causing organisms.

Specifically, the Complaint alleges that on various dates from August 1994 through December 1996, the molybdenum concentration limit of 75 milligrams per kilogram for the land application of sewage sludge[1] was exceeded, violating 40 C.F.R. 503.13(a), ("the molybdenum violation" or "Count I"), and that, on various dates in February and March 1994, the City failed to satisfy the Class A or Class B pathogen reduction requirements before applying sludge to land, in violation of 40 C.F.R. 503.15(a)(1), ("the pathogen violation" or "Count III"). Upon Motion by EPA, Count II was dropped.[2] EPA seeks a total civil penalty of $52,000 for the remaining (I and III) Counts,[3] a

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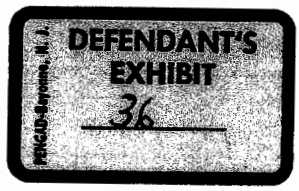
[1]"Sewage sludge" or "sludge" refers generally to the solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. See 40 C.F.R. § 503.9 (w) for a more detailed definition of this term.

[2]As originally filed, Count II alleged that the Respondent failed to sample and/or analyze sewage sludge applied to agricultural land for Kjeldahl nitrogen and ammonia nitrogen, as required by 40 C.F.R. § 503.8(b)(4). On April 12, 1999 EPA filed a Motion to withdraw Count II. The original Complaint sought $54,000 for the three counts while the Amended two count Complaint reduced the penalty proposed to $52,000. The Court granted EPA's Motion on May 7, 1999.

[3]The City filed a Motion for Accelerated Decision, arguing that it should prevail as to Count I, on the grounds that, as it had complied with the October 16, 1996 Administrative Order ("AO"), that Count should be dismissed. The Motion was denied on May 7, 1999. At the hearing the Court explained that the denial was based on the fact that the dates in the AO were



reduction from $54,000, the amount sought originally for all three counts.

The Molybdenum Violation

The regulation alleged to have been violated in Count I, 40 C.F.R. § 503.13(a),[4] provides:

> Sewage sludge. (1) Bulk sewage sludge[5] or sewage sludge sold or given away in a bag or other container shall not be applied to land if the concentration of any pollutant in the sewage sludge exceeds the ceiling concentration for the pollutant in Table 1 of § 503.13.

Table 1, in turn, provides a ceiling of 75 milligrams per kilogram for the pollutant molybdenum.

EPA witness, environmental engineer Valdis Aistars, is the sludge program manager for EPA Region 5. He testified that sludge is regulated because of pathogens and excessive amounts of metal it may contain.

Addressing Count I, Mr. Aistars explained that the molybdenum may enter the wastewater process from industrial sources, as it is found in paints, lubricants and oils, among other sources. Tr. 43. For molybdenum, EPA concluded that the "pathway," that is to say the means by which that metal would enter the environment, is absorption by plants and, thereafter, through ingestion by cows. Tr. 43. The witness explained that if land applied sludge exceeds the ceiling concentration for molybdenum there is a risk that it may enter the food chain through this pathway, resulting in molybdenosis, a condition

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not identical to those set forth in Count I and that the terms of the AO did not preclude such an action. Indeed, the AO expressly provides that "[n]either the issuance of this order by the USEPA nor compliance with this order by Marshall shall be deemed to relieve Marshall of liability for any penalty, fine, remedy or sanction authorized to be imposed pursuant to Section 309(b), (c), (d) and/or (g) of the CWA, including but not limited to any and all violations addressed in this Order." Joint Exhibit 4, 8. The City also contended that by undertaking construction of new pollution control facilities, 40 C.F.R. § 503.2A operated as a defense to Count III. The Court determined that sufficient factual issues remained and therefore denied that aspect of the motion as well.

[4]33 U.S.C. § 1345(e), the statutory basis for the regulation, provides: "...it shall be unlawful for any person to dispose of sludge from a publicly owned treatment works...for any use for which regulations have been established pursuant to subsection (d) of this section, except in accordance with such regulations."

[5]"*Bulk sewage sludge*" is defined as "sewage sludge that is not sold or given away in a bag or other container for application to the land." 40 C.F.R. §503.11(e).

that may result in damage or death to cattle.
Tr. 39.

The basis for EPA's case that the molybdenum ceiling was exceeded rests entirely upon the annual reports and associated data submitted by the City to EPA. Tr. 45. Exhibit JX 6 reflects the record of the sludge that was hauled and land applied for the City in 1994. Tr. 46. JX 7 and JX 8 are similar records, reflecting the same information for 1995 and 1996. These exhibits reveal, for each year, the number of loads of sludge that were land applied for each day of each month. Tr. 48-49. Each load amounts to 7,000 gallons. Using the exhibits, which amount to charts, one can determine the number of loads that were applied on any given day for each month. Tr. 49. These exhibits do not, however, by themselves inform whether the loads of sludge had excessive molybdenum. Tr. 50. To determine this, one must also consult exhibits, JX 1, JX 2 and JX 3, which are, respectively, the City's quarterly monitoring reports for 1994, 1995, and 1996.

As an example, at page 11 of JX 1 the average concentration of molybdenum is recorded as 94.55 mg./kg. That value reflects that, at some point during the monitoring period recorded on that page, which ran from July 1, 1994 through September 30, 1994, the City sampled their sludge and derived a maximum laboratory value of 94.55 during that period. [6] The corresponding maximum "permit requirement" of 75 is listed immediately below that figure. JX 1 at 11.

The actual laboratory sampling results or "bench sheets" are the original source for the concentration values and these are reflected in JX 25. That exhibit, consisting of 35 pages, reflects the lab results for the sludge sent by the City to MVTL Laboratories. The lab results reflect sludge analyses from May 1994 through November 1996. As an example, page 3 of the exhibit records[7] that on August 10, 1994 MVTL analyzed a sludge sample that was taken on August 8, 1994, resulting in a value of 94.55 mg/kg.[8] The witness also pointed to Exhibits JX 2 and JX 3,which reflect the "Annual Reporting Requirements for Class B Sludges" for 1995 and 1996, noting that under the monitoring period dates of September 28, 1995 and November 16, 1995 molybdenum values of 126.1

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[6]The witness contended that one could not tell whether the 94.55 "average" was based on one, or several, samples. Tr. 52. However, it seems improbable that more than one sample was taken during this period, at least for molybdenum, as the average concentration and the maximum concentration reflect the same 94.55 value.

[7]Although the poor quality of the copy makes it difficult to see, the date and pertinent value listed on page 3 are discernable, and reflect that the analysis was made from an August 8, 1994 sludge sample. No challenge was made to the figures identified on the copy.

[8]As another example, Exhibit JX 1, at page 14, covers a monitoring period from October 1, 1994 through December 31, 1994. As with JX 1 at page 11, the form at page 14 reflects "land application" with an average concentration value of 143.6. The maximum concentration value is an identical 143.6. This figure is also reflected at JX 25 at page 5, informing that the 143.6 value was derived from a November 23, 1994 sample taken from a "sludge storage tank."

and 176.1 were recorded together with values of 119.8, 108.3 and 129.3 for, respectively, October 14th, November 6th, and December 5, 1996. Unlike the 1995 Annual Report, the 1996 Report was accompanied by a cover letter. This letter informed EPA that the biosolids from November 6th and December 5th were not land applied and that a subsequent analysis reflected a molybdenum concentration of 67.33 mg/kg. In contrast, referring to the October 14th result of 129.3, the City acknowledged that those biosolids, which came from drying beds, were land applied prior to the City receiving the lab results. JX 3, at page 1.

The Pathogen Reduction Violation

For Count III, the regulation alleged to have been violated, 40 C.F.R. § 503.15(a), provides:

> *Pathogens - sewage sludge.* (1) The Class A pathogen requirements in §503.32(a) or the Class B pathogen requirements and site restrictions in § 503.32(b) shall be met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site.

The pathogens addressed include parasites, bacteria, such as E. coli, or viruses, all of which may end up at the treatment plant, as part of the wastewater. These present an obvious potential for harm to the public health and to the environment. Tr. 38. As the sludge in this case was applied to agricultural land, the Class B pathogen requirements apply. Section 503.32(b) provides that sewage sludge must be treated by one of the processes to significantly reduce pathogens as described in Appendix B.[9] This Appendix provides for a 15 day sludge digestion period at 35 to 55 degrees Celsius and a 60 day period where the temperature is only 20° Celsius.[10] Outside of these, a formula can be applied to determine whether other combinations of temperature and time will accomplish anaerobic digestion.[11] Tr. 61, 66.

There is no dispute that the City employs anaerobic digestion process at its wastewater plant, a method involving the decomposition of pathogens by means of their containment within an airless environment, for periods of time at certain temperatures. EPA maintains that the City did not satisfy those requirements during February and March of 1994. Tr. 71.

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[9]Other methods to achieve pathogen reduction include using lime (calcium carbonate), aerobic digestion, composting and air drying. Tr. 62.

[10]This is not the exclusive method to effect pathogen reduction. Other options include use of "lime" (calcium carbonate), aerobic digestion, composting and air drying. Tr. 62.

[11]The City did not challenge the validity of the formula, described at Tr.66-67 and set forth at Exhibit 32, for determining the pathogen residency requirement. The formula is: $3T + D \geq 120$, with T representing the average Celsius temperature and D, the average residence time.

As with the Molybdenum violation, EPA relies upon the City's records to establish this Count.[12] To do this, it looks to the digestion tracking sheets set forth in Exhibit JX 9. That document, pertaining to February 1994, is described by the heading "503 Compliance Tracking for Class B Pathogen Treatment and Vector Attraction Reduction." The bottom center of this document lists the "Average SRT." SRT or "Solid Retention Time" refers to the average number of days the sludge remained in the digester. The figures for February 1994 reflect 12.39 days, a duration less than the minimum retention time of 15 days. Using these records in conjunction with the City's sludge hauling records, EPA concluded that nearly a million gallons of sludge not meeting the pathogen reduction requirements were applied to land.

Exhibit JX 10, a parallel document to JX 9, but which pertains to March 1994, required consultation with a formula to determine the minimum number of days the sludge had to remain in the digester. This was necessary, even though the average residence time for the sludge was 18.04 days, because the average temperature, at 26.8° C., was well below the minimum 35° C. needed for a 15 day residency. The City did not challenge the conclusion that, at least based on JX 10, the sludge did not have sufficient time in the primary digester to satisfy the regulation but it maintains that the sludge went to a secondary digester before any land application. Tr. 80. In response, EPA maintained that the agency operates on the assumption that the representative sample is, by definition, representative of the sludge that is land applied. Tr. 81.

The City's Arguments

The City raises multiple objections to the charges in this litigation. It asserts that EPA's case offers no fact witnesses regarding the allegations and that EPA's entire case rests upon the Agency's interpretation of the applicable regulation together with its interpretation of documents that the City provided. Additionally, it argues that the phrase "representative sample" is unclear, that the regulation does not prohibit averaging the test results, and that, in any event, the regulation does not spell out the consequences for an elevated concentration. Last, Respondent contends that it is unfair to infer a continuous violation until new tests return to, or below, the ceiling limit. Specific discussion of these issues follows.

The City's argument begins with the undeniable premise that EPA must prove, by a preponderance of the evidence, that the alleged violations in fact occurred. From this starting point, the City takes the view that this burden encompasses "prov[ing] each allegation of every Count ... [including] the authenticity of scientific evidence ... the [meaning] of the phrase 'representative sample'...[and showing that the regulation makes it] unacceptable to average the required quarterly test results..." City Brief at 3. This burden includes demonstrating the accuracy of the laboratory testing, and identification of the bio-solids that were tested. Id. at 9. Further, the City believes that EPA must meet this burden for each of the 118 dates for Count I and, failing this, it argues that the entire Count should be dismissed. Id. at 12. Absent such proof, in its view, EPA's case rests upon conjecture,

[12]Count III asserts that sludge not meeting the pathogen requirements was applied to land on February 22, 23, 24, 25, 28 and March 1, 2, 9, 10, 11, 1994.

speculation, inference and supposition. Id. at 4.

Regarding Count I, the City notes that EPA produced no eyewitnesses to the sludge land application process and asserts that EPA's case rests upon the agency's "subjective interpretation of records submitted by the City." Id. at 5. In its view, EPA's own witness was vague in explaining what constitutes a representative sample or how one is taken. It submits, if EPA is uncertain about this, the regulated community cannot be expected to understand these matters. Noting that the regulation requires land-applied sludge to be tested only once per quarter, the City also objects to any suggestion that it must conduct more frequent tests.

The City also maintains that Section 503.8's requirement for "representative samplings"[13] allowed it to average its quarterly samples, a practice when applied in this case results in no molybdenum values above the ceiling concentration limit for any single year. In this vein, the City asserts that it did not become aware that averaging was impermissible until it received EPA's October 28, 1996 Administrative Order.[14]

Additionally, Respondent views EPA's position, that any test result with a value above the ceiling constitutes a violation, as a "strained and unreasonable interpretation [that is] inconsistent with the regulation itself." Id. at 7. Averaging samples, the City argues, represents a more accurate reflection of the actual land application practices.

The City also points to other deficiencies in the EPA case. It notes that while the Complaint refers to liquid sewage sludge, the test results used to show exceedances are not limited to *liquid* sewage sludge. The City points to the October 14, 1996 results, which pertained to *dry* sludge from its lagoon drying beds and it suggests that this sludge may have been mixed with other sludge. Id. at 10-11. Noting that the EPA witness, Mr. Aistairs, indicated some mixing occurred, (Tr.82) the City reiterates that proving such mixed sludge still exceeded the ceiling and showing which sludge was in fact then land applied are all part of EPA's evidentiary burden.

Analogizing its position to that expressed In the Matter of Bradley Petroleum Docket No. RCRA (9006)-VIII-94-08, April 23, 1998, 1998 WL 289275 (E.P.A.), ("Bradley"), where the complaint was dismissed because EPA failed to show that the methods used by the respondent for testing and monitoring would not comply with the regulation, the City asserts that EPA has not shown that its method to monitor compliance failed.[15]

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[13]The Court notes that the regulation actually requires "Representative samples," not "Representative *sampling*" of sewage sludge that is applied to the land.

[14]The Court further notes that the Administrative Order makes no reference to the subject of sample averaging, nor did the City direct the Court to such a reference.

[15]Presumably, the City is referring here to its claim that the regulation permits averaging sample results. Bradley is not remotely relevant to this matter. EPA alleged that Bradley had

With regard to Count III, the alleged failure to meet the pathogen reduction requirements, the City asserts that the sludge haul records for February and March 1994, relied upon by EPA to establish the violation, do not relate to same sludge held in residency during those months. The City points to Exhibits JX 2 and 16 to establish that it employed a two-stage treatment process. Further, it argues that since 1995 it has utilized the alternative sampling process set forth at 40 C.F.R. 503.32(b) by monitoring for fecal coliform. Id. at 15.

For both Counts, the City argues that 40 C.F.R. § 503.2(a) applies. That regulation provides:

> Compliance with the standards in this part shall be achieved as expeditiously as practicable, but in no case later than February 19, 1994. When compliance with the standards requires construction of new pollution control facilities, compliance with the standards shall be achieved as expeditiously as practicable, but in no case later than February 19, 1995.

Emphasizing that the regulation became applicable on February 19, 1994 only for "those facilities that were not under construction," the City maintains that as it had embarked on such construction, the effective date for its wastewater plant did not come into effect until February 1995. Id. at 16. (emphasis in brief).[16] It was not contested that, in April 1992, the City voted to spend 5.2 million dollars to improve its treatment facility, completing the construction project in December 1994. In its view, the extension applies where the City believed, in good faith, that the construction was necessary to achieve compliance. It contends that it is unfair to determine whether the extension applies by examining whether the treatment plant is in compliance after the construction. Further, EPA's gauging the applicability of the extension on post-construction results ignores the City's use of fecal coliform monitoring as an alternative method of meeting the pathogen reduction requirements. Id. at 20.

The City also raises the defense of estoppel.[17] This contention relies upon the City's interpretation that by complying with the Administrative Order it would avoid further enforcement action. In this connection it lists the actions it took to come into compliance with that Order and asserts "[i]f the USEPA can use information requests under the pre-text (sic) of monitoring compliance with an Administrative Order, and then use information not required by law to be maintained to prove liability

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failed to provide a release detection method in accordance with the regulations and that the respondent's method was unreliable. Here, quite differently, EPA has based its case on the *accuracy* of Respondent's own records.

[16] If accepted, the effect of the City's interpretation would result in 62 days of the 118 days of violation in Count I being dismissed. All of the Count III allegations occurred before February 19, 1995.

[17] Under this heading the City also revisits the defense, already outlined, that by the terms of 40 C.F.R. 503.2, it had until February 19, 1995 to come into compliance.

for the same offenses, it would have a chilling effect ...[and] foster an adversarial relationship ... [instead of] cooperation. Id. at 18. At a minimum, it argues that its good faith cooperation should be considered as a factor mitigating the penalty.

In its Post-Hearing Reply Brief[18] the City objects to EPA's characterization of its conduct as evincing a blatant disregard for public safety and the federal regulations, as well as to EPA's description of the City's attitude toward sludge disposal as "deplorable" and the assertion that it would be "difficult to imagine more egregiously derelict behavior." City's Reply Brief at 1, citing EPA's Post-hearing Brief at 32.

EPA's Arguments

After noting that the regulations require the quarterly collection of representative sludge samples, EPA argues that the term 'representative' is not as elusive of definition as the City suggests, and submits that the sample must be representative of what the facility applied to the land for a given quarter. Similarly, the analytical results must reliably describe the sludge contents.

EPA does not dispute that of the 117 days of violation alleged in Count I, there is direct evidence of violations for only six of those days and that it relies upon "circumstantial evidence" for the other days. EPA's position is that "every land application which occurred between the date on which Marshall's sampling first indicated a violation and the date on which Marshall's sampling first indicated a return to compliance is a violation of 40 C.F.R. § 503.13(a)(1)." EPA Brief at 5. It argues that it is appropriate for the Court to "draw the reasonable inference that the violations continued until Marshall's sludge analysis demonstrated compliance." Id. at 4.

Regarding Marshall's challenge to the accuracy of the sampling results, EPA notes that the City, as the land applier of sludge, bears the responsibility for the sampling and the lab analysis.
In response to the City's argument that, because it does not apply *dry* sludge, the actual concentrations applied would be lower because the sludge, as applied, is diluted with water, EPA points out that the regulation, 40 C.F.R. § 503.13(b)(1), provides for compliance with the metal limits on a dry weight basis. Although EPA agrees that the City was under no affirmative obligation to conduct resampling, it notes that, once faced with the results showing an exceedance, there was an implicit obligation to resample before continuing with land application or to turn to the other options available for the sludge disposal.

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[18]The City and EPA each filed a Post Hearing Brief and two Replies. Each was duly considered by the Court. Beyond these objections, the City reasserts its argument that EPA's burden of production includes proof that the violations in fact continued after the alleged exceedance of the ceiling for molybdenum. As previously described, under the City's view, EPA is obligated to show "that there were actual applications of sewage sludge to the land ... for each and every date listed in Count I Exhibit A of the complaint." City Reply Brief at 2. Consistent with this assertion is the City's view that it is EPA's burden to show that the tests were accurate.

As to Count III, EPA argues that the City does not qualify for the one year extension from compliance provided by 40 C.F.R. § 503.2, as the extension, in its view, only operates where compliance *requires* construction of the new facilities. EPA takes the position that this means there can be no other disposal options, beyond land application, available to a wastewater treatment facility such as the City. Given the options available for both violations, such as liming, blending, incinerating, or landfilling the sludge, the extension should not apply. Additionally, EPA maintains that because the record shows that the City continued to violate the anaerobic digestion requirements for several months after the construction had been completed, this demonstrates that the project could not have been required to achieve compliance. Although the construction was complete by the end of December 1994, the record reveals that, through application of the formula, the City continued to violate the pathogen reduction requirements from January through March 1995. Thus, EPA maintains that eligibility for the extension requires a showing that, once the construction is complete, the result is that the facility *in fact* comes into immediate compliance.

In response to the City's argument that estoppel should be applied because of the City's claim that EPA's Administrative Order implied that no civil enforcement action would ensue if the City came into immediate compliance, EPA notes that the plain terms of the AO refute the claim.

DISCUSSION[19]

Issues Regarding Count I

1. *Whether EPA must provide witnesses to the sampling and land application process.*

The City notes that EPA provided no witnesses to verify the accuracy of the sampling nor witnesses to the land application process and that the Agency's case rests entirely upon records submitted by the Respondent. However, the City also concedes that the laboratory tests were performed by an entity hired by the City to do those tests. Tr. 32. Although the Court addressed the City's position during the hearing,[20] rejecting the argument that EPA must establish the reliability of the test results, additional comments are in order.

Section 503.7 provides:

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[19]Except for those issues specifically addressed in the body of this decision, all other determinations necessary for liability to attach are found to be present. These include, for example, that Respondent is an owner and operator of a publicly owned treatment works and generates sewage sludge during the treatment of domestic sewage. The decision focuses on the matters remaining in dispute.

[20] The Court also noted, and the City conceded, that it did not raise this argument in its Answer. Tr. 33. However, even if it had done so, the conclusions reached by the Court would be the same.

> **Any person who prepares sewage sludge *shall ensure* that the applicable requirements in this part are met *when the sewage sludge is applied to the land...***

40 C.F.R. § 503.7 (emphasis added).

As EPA observes,[21] meeting the responsibility to "ensure that the applicable requirements in [the] part are met" includes the representative sampling and analysis of those samples. In this regard, Section 503. 8(a) provides: "**Representative samples of sewage sludge that is *applied to the land* ... shall be collected and analyzed.**" 40 C.F.R. § 503.8(a) (emphasis added). These responsibilities belong to the preparer of sewage sludge.

Taking these provisions into account, together with the City's concession that "[t]he only item supported by the record is that the City, as required by the regulation, at some point took quarterly samples, and that some of these samples showed above 75 mg/kg of molybdenum." Id. at 13, establishes a prima facie case. In the Matter of City of Salisbury,Maryland , Docket No. CWA-III-219, 2000 WL 190658 (E.P.A.), February 8, 2000. Thus, attempts to deflect responsibility on the basis of putative vagueness by an EPA witness in defining a "representative sample" misses the mark; the burden to comply with the provisions reside with the preparer of sewage sludge. Nor is the term as elusive as the City suggests. A representative sample is simply "[o]ne that exemplifies or typifies others of the same class." Webster's II New College Dictionary (1995). The Respondent's witness, Mr. Keith Nelson, the City's engineer and director of public works, never expressed any confusion about the concept of a representative sample. Tr. 194. Nor did the witness believe that averaging

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[21]EPA, after noting that 40 C.F.R.§ 503.16 sets forth the frequency of monitoring, requiring in this instance quarterly data collection, asserts that "40 C.F.R. § 17(a)(4)(I)(A) requires Marshall to collect samples and analyze for all of the metals listed at 40 C.F.R. §503.13(b), including molybdenum." EPA Reply Brief at 2. However, the section EPA cites refers only to the Equal Access to Justice Act. Even 40 C.F.R. § **503**.17(a)(4)(I)(A) does not exist and if EPA actually meant 40 C.F.R. § **503**.17(a)(4)(**i**)(A), that section refers to recordkeeping and a retention period for such records, for the pollutants listed in Table 3 of §503.13 in the bulk sewage sludge. Consultation with Table 3 reveals that molybdenum is not one of the addressed pollutants. If EPA meant to refer to 40 C.F.R. §**503**.17(a)(**5**)(**i**)(A), that provision is triggered if the requirements in §503.13(a)(2)(i) are met when bulk sewage is applied to agricultural land, forest, a public contact site, or a reclamation site and requires development and retention of the concentration of each pollutant listed in Table 1 of § 503.13. Molybdenum is among the listed pollutants for that table. Regrettably, this is not an isolated incident. Even in the Complaint, EPA asserted, for Count I, that the Respondent's actions violated "33 U.S.C. §1415(e)." That section relates to "Ocean Dumping,"not land-applied sewage sludge. The Court has noted previously EPA's lack of attention to correct citations. See In the Matter of Pioneer Engineering Chemical Company , Docket No. RCRA 6-006-99, December 14, 1999, 1999 WL 1442333 (E.P.A.). Given the complexity of the regulations, EPA should correctly cite the provisions it relies upon.

samples excused one from the ceiling limit:

> The Judge: Mr. Nelson, you were never laboring under the idea were you that as long as you averaged out that it was okay to exceed the ceiling limit?
>
> The Witness: No, we did not believe it was okay to exceed the ceiling limits.

Tr. 195.

2. *Whether EPA established continuing violations for Count I, the Section 503.13(a) violation.*

The City argues that, even if a sample demonstrates an exceedance of a pollutant's ceiling concentration, it is unreasonable to conclude that all subsequent land applications of sludge also exceed the ceiling until retesting shows the concentration has returned to a level which is at, or below, the limit. Tied to this is the City's related argument that the regulation, 40 C.F.R. § 503.16, requires no more than quarterly testing.

The City notes that 40 C.F.R. § 503.16 requires sampling once per quarter[22] and that the regulation does not prescribe additional testing. While the City acknowledges that EPA has suggested additional testing in its guidance, it maintains that EPA is not entitled to deference in the interpretation of its regulations, citing In the Matter of Phibro Energy, Inc., CAA-R6-P-9-LA 92002 (1994)[23]

The Court finds that the inference of a continuing violation is reasonable. While it is possible that sludge subsequently generated may not in fact exceed the ceiling, it is also possible that the post-sample sludge may continue to violate the ceiling at, or even above, the sample result. Although the City is correct that the regulations do not mandate additional testing,[24] one cannot fairly object to the inference of a continuing violation while turning away from the opportunity to demonstrate that

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[22]The frequency of monitoring is keyed to the number of metric tons of sewage sludge applied per year. Where the tonnage is equal to or greater than 290 but less than 1,500 metric tons, quarterly monitoring is required.

[23]The Respondent incorrectly cited the case as "Philbro Energy, 1997." Phibro Energy, a Clean Air Act case, involved an interpretation of a regulation requiring timely performance evaluations of certain monitoring equipment. In Phibro, the administrative law judge did state: "The deference standard is an appellate review standard, and is not applicable at the trial level. At the trial level, the question is whether the interpretation contended for by the agency is reasonably supported by the language of the regulations and formal interpretative policy statements by the agency." 1994 WL 594881 (E.P.A.).

[24]EPA agrees that no additional testing is required by the regulations.

an exceedance of a pollutant ceiling has ceased. Further, the regulated community cannot have it both ways: complaining of government over-regulation and excessive regulatory presence and then, having succeeded in gaining the right to self-monitor compliance, turn around and assert that such over-regulation and omnipresence is required to establish any continuing violations.

It is noted that the inference is balanced and operates evenhandedly. Thus, when a quarterly sample shows no pollutant ceiling exceedances, the inference operates to insulate the wastewater treatment plant by presuming that all subsequent land applications for that quarter also satisfy those ceilings.

This conclusion also operates to resolve the City's related argument that it is EPA's burden to establish that the tested sludge is the same sludge that was land applied. The burden that representative samples be taken by those who generate the sludge makes clear that those samples are required to be representative of the sludge that is *applied to the land.* 40 C.F.R. §503.8(a).

3. *Whether the lack of a "Cumulative Load" for Molybdenum is relevant.*.

The City has pointed to the absence of a cumulative load limit for molybdenum, noting that many other pollutants have such a limit. A "cumulative load" refers to the maximum amount of a particular metal that can be applied to a parcel of land over its lifetime. Tr. 95, 40 C.F.R. § 503.11(f). However cumulative loads are irrelevant to liability in this proceeding. Although there is a *ceiling limit* for molybdenum, there is no cumulative load. Nor does the regulation cited by EPA for Count I make any reference to a cumulative load exceedance. Thus, in terms of liability for Count I, the only issue is whether the *ceiling limit* has been exceeded.

4. *Whether "Dry Bio-Solids" sample tests affect liability where the sludge is later applied as a liquid.*

The City perceives a conflict when a sludge sample from "Dry Bio-Solids" is later applied as liquid sludge. Observing that Exhibit JX 25 at p. 21 describes the October 14, 1996 sludge sample as "Dry Bio-Solids," it maintains that such lab results are not reflective of the actual land application since the sludge was applied as a liquid.

The Court notes that the various lab reports, reflected in JX 25 and which involve samples from April 1994 through December 1996, certainly provide a variety of descriptions for the sludge samples. While most samples are described as "liquid sludge" other descriptions include "sludge storage tank," "drying bed sludge," "liquid sludge composite," "sludge," and "Liquid Bio-Solids." Despite this variety, most reports reflect that the results are reported on a dry basis or dry weight. However, as EPA observes, the pollutant limits, as reflected in the table setting forth the ceiling concentrations for various metals, including molybdenum, provide that the limits are measured on a *dry weight basis.* 40 C.F.R. § 503.13(b)(1), Table 1. Thus the distinction the City attempts to draw between dry weight basis samples and liquid sludge applications is not relevant. Once a dry weight sample shows a value above the ceiling, land application is not permitted until the sludge has been modified to bring it back within the limit. Conspicuously, the City has not offered any

subsequent sampling results to support its suggestion that the liquid sludge it applied to the land had a molybdenum value which did not exceed the ceiling.

Issues Regarding Count II

Through the use of the City's own records, as reflected in Exhibits JX 6, JX 9 and JX 10, EPA has established a prima facie case that the pathogen reduction requirement for sewage sludge was not met. Although the City employed a tact similar to that advanced for Count I, by asserting that the sludge haul records for February and March 1994 do not relate to the same sludge that was held in the digester, that argument is also rejected here. In the face of those records, the City suggests that its certification that the process they used met the proper pathogen reduction is evidence that they were in compliance.[25] However, given the records of the digester residency time, the certification means little.

The chief argument raised by the City, regarding Count II, is that the residency time should be doubled from that reflected in Exhibits JX 9 and 10. This argument, which relies primarily upon the testimony of the City's engineer, Mr. Keith Nelson, maintains that, by including the secondary digester in the computation, the true residency time was double the 12.39 days, reflected in JX 9 and the 18.04 days in JX 10.

During Respondent's cross-examination of Mr. Aistairs, the EPA witness acknowledged having no personal knowledge of the City's pathogen control practices. However, when counsel for the City suggested there was also a secondary digester used for pathogen reduction, the witness observed that no documents demonstrate that the sludge is held in a secondary digester. Tr. 80. In response to questions inquiring whether he knew if the samples were taken or whether samples were from the primary digester or the storage tank, the witness explained that the assumption is that the sample is representative of the sludge that is land applied. Tr. 81.

The problem with the City's argument is that the mere assertion of the presence of a secondary digester is insufficient to overcome the records showing an inadequate pathogen reduction residency for the sludge. The City's engineer testified to the presence of two primary digesters, each with a 300,000 gallon capacity, and also asserted that the sludge then travels to a secondary digester, with an approximate 600,000 gallon capacity. He acknowledged that the secondary digester is not heated. Significantly, the City maintains no records of the time sludge spends in this second digester. Tr. 202-204. Without records to support the secondary digester residency claim, there is insufficient

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[25]Post-hearing, the City has denied that the regulation provides any formula for determining whether the digester time/temperature residency requirements have been met, and it notes that the regulation does not otherwise spell out how the "floating average" should be calculated. The problem with this argument is that the formula EPA presented went unchallenged during the hearing. Thus, at least on this record, the Court concludes that the formula is a reliable means for determining the minimum residency time and temperatures required for values not specifically addressed in the Appendix.

evidence to overcome the establishment of a violation, as demonstrated in JX 9 and JX 10. Nor is the City's alternative contention, that its fecal coliform tests prove that it met the pathogen reduction requirements, availing. Those tests did not commence until 1995 and on that basis alone they are not relevant to the March and April 1994, the time period addressed in Count III.

THE SECTION 503.2(a) DEFENSE

40 C.F.R. Section 503.2(a) provides:

> Compliance with the standards in this part shall be achieved as expeditiously as practicable, but in no case later than February 19, 1994. When compliance with the standards requires construction of new pollution control facilities, compliance with the standards shall be achieved as expeditiously as practicable, but in no case later than February 19, 1995.

This section, seemingly at odds with itself, is not a model of clarity. While the first sentence is unqualified in its command that compliance shall be achieved "in *no case* later than February 19, 1994," the next sentence retreats from that command, by offering a circumstance where compliance may indeed be extended, up to a year later. The *only* qualifier for entitlement to the one year extension is "[w]hen compliance with the standards requires construction of new pollution control facilities ..."

Thus, unrebutted evidence that compliance requires construction of new facilities affords sewage treatment works up to a one year extension from all of the Part 503 standards. Clearly the language of the section does not provide that an extension is contingent upon a facility coming into immediate and continuous compliance, as soon as the required construction is completed. Nor would it be reasonable to infer that a facility must attain regulatory perfection upon completion of the construction. Such a harsh interpretation would be at odds with the reality that new equipment frequently needs fine tuning. It is also possible that, having made such an expenditure, in good faith reliance on the civil engineers' advice, a facility could thereafter discover that still more needs to be done in order to achieve compliance. Further, the exemption speaks globally, requiring only a showing that "compliance with the standards requires construction." Thus, by its plain terms, a facility need not show that new construction was necessary for each standard cited; only a general showing that "compliance with the standards" is required for the extension to apply.

This conclusion is supported by the EPA's final rule for "Standards for the Use or Disposal of Sewage Sludge." 59 FR 9095, February 25, 1994. Without attaching conditions or any post-construction performance standard for eligibility, the Agency merely explained that an extension was available where compliance with the regulation "requires construction of new pollution control

facilities..." Id at 9098.[26]

Here, there is unrefuted evidence that the City determined, upon consultation with engineers, that construction of new pollution control facilities was required. Tr. 154-157,178, 187- 188, Exhibit JX 30. Certainly the City's expenditure of 5.2 million dollars for the project refutes any notion that the construction was a sham, intended merely to postpone being cited for violations for a year. Tr. 158-159. In addition, the City offered credible testimony that the installation of the trickling filters impacted the quantity of sludge production. Finally, it is noted that the extension does not insulate any facility from accountability for violations beyond February 19, 1995. Once that date passed, even if fine tuning new equipment, or upon a late discovery that the new

construction was still not sufficient, a facility is fully subject to the Part 503 standards and attendant civil penalties.

Given this determination, the instances of recognizable violations within Count I are reduced to include only those loads of land-applied sewage sludge occurring from September 28, 1995 through November 7, 1995, while the violations alleged for Count III, occurring during February and March 1994, are dismissed.

DETERMINATION OF AN APPROPRIATE PENALTY

In its original pleading, EPA sought a $54,000 penalty for three Counts. Under the amended Complaint EPA proposed a penalty of $52,000 for the remaining two Counts. EPA does not have a penalty policy for a presiding judge to consider in assessing Clean Water Act violations and EPA concedes that the Presiding Judge must look to the statutory factors. Tr. 11. Further, the Court notes that the record contains no evidence of EPA's allocation of penalty amounts ascribed for each statutory criterion for each Count, nor was any overall breakdown offered for any of the three Counts, as originally pled, nor subsequently, for the two Counts remaining in the Amended Complaint. Tr. 132. Nor, was there particular administrative certainty that the $54,000 originally sought was correct. As Mr. Aistairs explained, he inherited the file and the proposed penalty figure from another. When asked if he would reach the same valuation for the penalty, he responded: "I may have and I may not have." Tr. 116. The witness candidly conceded that even for the same violations, the proposed penalties are not always uniform. Tr. 124. Finally, EPA acknowledged that, in terms of computing an appropriate penalty, it offers no penalty calculation input and cedes the determination solely to the Court. Tr. 136-138.

As explained above, as a consequence of the Section 503.2(a) defense, only twelve instances of land-applied sewage sludge are recognizable violations. Section 309(g)(3) of the CWA, 33 U.S.C. § 1319(g)(3), provides that any penalty under this section shall take into account the nature, extent,

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[26]From the beginning to the final rule, no Agency announcement suggested the interpretation EPA now attempts to graft on to the rule for the extension period to apply. See E.P.A. Environmental News, December 1, 1992, EPA 92-R-249.

circumstances and gravity of the violation; the history of violations; the degree of culpability; the economic benefit derived from non-compliance; ability to pay; and such other factors as justice may require. Considering each of these factors, the Court concludes that a $6,000 penalty is appropriate.[27] Further, even if it had been determined that the Section 503.2 defense was inapplicable, the Court would have departed from the penalty proposed by EPA for the reasons which follow.[28] These reasons were also considered in arriving at the penalty imposed today.

As to the nature of the violation, it is noted that the City did not generate the molybdenum on its own. Rather, wastewater from industrial users was the source of the metal. While no excuse for exceeding the ceiling, it is still a factor to be considered in assessing a penalty. Second, the Court may take notice, in the penalty context, that there is no cumulative limit for molybdenum. Third, there was no evidence that any cattle actually developed molybdenosis in this instance.

In terms of the circumstances of the violations, the Court finds that the City's interpretation that it could take an average of the samples of sewage sludge, was not reasonable, given the plain terms of Section 503.8(a). Further, the City should have waited for the lab results before applying the sludge to land; to do otherwise renders the regulation a nullity. As Mr. Aistairs noted, once sludge exceeding the ceiling is applied, there is no remedy. The same is true where the pathogen reduction is not met. Tr. 110. It is also true that the City had alternatives to the agricultural land application. These included blending, incineration, and application at a landfill.

On the other hand, it is noted that early on the City did hire civil engineers and, in 1992, embarked on an expensive project, expending 5.2 million dollars for the construction of new pollution control facilities.[29] Testimony of the Mayor of the City of Marshall, Mr. Robert Byrnes, Tr. 154-158. Mr. Aistairs conceded that EPA was not aware that the City had employed engineers to help achieve compliance. Further, EPA already had arrived at its proposed penalty calculation prior to receiving information from the City regarding its construction of new pollution control facilities. Tr. 130. It would not be appropriate for the Court to view the violations here in the abstract, apart from consideration of the large expenditure, made early on, by this relatively small community to improve its wastewater facility. EPA's view, that for such a large expenditure to count in formulating a penalty, the facility would need to demonstrate instant and unblemished

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[27]It is noted that during the period covered by the Section 503.2(a) defense, there were 61 land applications involving 565 truckloads and that in the period after that time there were 56 land applications involving 574 truckloads. During the time covered by the defense, molybdenum concentrations ranged from 94.85 mg/kg to 143.6 mg/kg, while in the post-defense period, the concentrations ranged from 108.3 mg/kg to 176.1 mg/kg.

[28]The City repeats some of its points in addressing particular penalty criteria. The Court agrees that arguments can have applicability to more than one criteria.

[29]EPA's Mr. Aistairs acknowledged that the City expended in excess of five million dollars on their wastewater treatment facility. Tr. 121.

compliance thereafter, is far too harsh a view and inconsistent with the reality of post-construction adjustments. Further, the City continues to take its wastewater responsibilities seriously; it continues to consult with engineers to help ensure compliance with the standards for wastewater treatment. Tr. 160. Suggestions by EPA that the City intentionally or recklessly disregarded the AO are unfair characterizations, unsupported by the record.

Regarding the prior history of violations, the city had no prior environmental violations nor has it been charged with any subsequent to the matters in issue. It has been recognized by awards from the Minnesota Pollution Control Agency for the operation of its wastewater facility. As EPA concedes, the City derived no economic benefit from noncompliance. The City's sludge applications are made without charge, as a service to the agricultural community.

Although the Court rejected the City's cooperation and submission of documentation to EPA as a defense to liability, it is true that it cooperated with EPA throughout the matter. As noted by the City, it "accepted and complied with the USEPA's wishes at all times subsequent to the filing and responses to the administrative order." City Brief at 9. This cooperation included promptly

providing all "USEPA information requests and deliver[y] [of] information not required by the regulation to the EPA that has been used in [the] proceedings to prove liability. Id. at 9.

Upon consideration of all these factors, the Court concluded that the $6,000 penalty is appropriate.[30]

ORDER

A civil penalty in the amount of $6,000 is assessed against the Respondent, City of Marshall, Minnesota. Payment of the full amount of the civil penalty assessed shall be made within thirty (30) days after this Initial Decision becomes a final order under 40 C.F.R. § 22.27(c). Payment shall be submitted by a certified check or cashier's check payable to the Treasurer, United States of America and mailed to:

Mellon Bank
EPA Region 3
Regional Hearing Clerk
P.O. Box 360515
Pittsburgh, PA 15251

A transmittal letter identifying the subject case and the EPA docket number, plus the Respondent's name and address must accompany the check. Failure of the Respondent to pay the

[30]Had the Section 503.2(a) defense not been accepted, the Court, looking at the same statutory criteria and the particular facts, as outlined above, would have imposed a total penalty of $12,000 for Counts I and III.

penalty within the prescribed statutory time frame after entry of the final order may result in the assessment of interest on the civil penalties. Pursuant to 40 C.F.R. § 22.27(c), this Initial Decision shall become a final order forty-five (45) days after its service upon the parties and without further proceedings unless (1) a party moves to reopen the hearing within twenty (20) days after service of the Initial Decision, pursuant to 40 C.F.R. § 22.28(a); (2) an appeal to the EAB is taken from it by a party to this proceeding, pursuant to 40 C.F.R. § 22.30(a), within thirty (30) days after the Initial Decision is served upon the parties; or (3) the EAB elects, upon its own initiative, under 40 C.F.R. § 22.30(b), to review the Initial Decision.

So Ordered.

William B. Moran
United States Administrative Law Judge

Dated: October 3, 2000

In the Matter of City of Marshall, Respondent
Docket No. 5-CWA-98-013

CERTIFICATE OF SERVICE

I certify that the foregoing **Initial Decision**, dated October 3, 2000, was sent this day in the following manner to the addressees listed below:

Original by Regular Mail to:

Sonja R. Brooks
Regional Hearing Clerk
U.S. EPA
77 West Jackson Boulevard
Chicago, IL 60604-3590

Copy by Regular Mail and facsimile to:

Attorney for Complainant:

Robert S. Guenther, Esquire
Associate Regional Counsel
U.S. EPA
77 West Jackson Boulevard, C-14J
Chicago, IL 60604-3590

Copy by Facsimile and Certified Mail to

Attorney for Respondent:

Jay D. Carlson, Esquire
First National Bank Building
15 Broadway, Suite 206
P.O. Box 448
Fargo, North Dakota 58107

Maria Whiting-Beale
Legal Assistant

Dated: October 3, 2000

IN RE CITY OF MARSHALL, MINNESOTA

CWA Appeal No. 00-9

DECISION AND REMAND ORDER

Decided October 31, 2001

Syllabus

This is an appeal by the U.S. EPA Region V and EPA's Office of Regulatory Enforcement (collectively the "Region") from an Initial Decision issued by Administrative Law Judge William B. Moran ("Presiding Officer") imposing upon Respondent, the City of Marshall, Minnesota ("Marshall"), a civil penalty of $6,000 for violations of section 309(g)(1)(A) of the Clean Water Act ("CWA"), 33 U.S.C. § 1319(g)(1)(A), arising from the alleged illegal application of sewage sludge on agricultural land in contravention of regulatory requirements codified at 40 C.F.R part 503.

The Region contends that the Presiding Officer erroneously reduced the $52,000 penalty the Region had proposed to $6,000. According to the Region, the Presiding Officer clearly erred in finding that Marshall had established a defense under 40 C.F.R. § 503.2(a), which provides a deferred compliance date for facilities that require construction of new pollution control facilities as a means of achieving compliance. The Region also argues that the Presiding Officer failed to consider in his penalty assessment evidence relative to Respondent's culpability as required by 40 C.F.R. § 22.27(b)

Held: (1) The Board upholds the Presiding Officer's conclusion that Marshall met its burden of presentation and persuasion in establishing a defense under 40 C.F.R. § 503.2(a). To sustain a defense under section 503.2(a), Marshall did not have to prove that construction of new pollution control facilities was the only means by which it could achieve compliance with part 503 regulations, nor did Marshall have to demonstrate that it achieved immediate compliance upon completion of construction. Rather, the pertinent question is whether, at the time the decision was made to pursue construction as a means of achieving compliance with the part 503 standards, Marshall had an objective good faith basis for believing that construction was the appropriate strategy. The Board finds no basis for rejecting the Presiding Officer's conclusion that this test was satisfied under the facts and circumstances of this case.

(2) The requirement in 40 C.F.R. § 22.27(b) that a presiding officer provide a detailed discussion of how the penalty assessed relates to the applicable statutory penalty factors serves the purpose of ensuring both that interested parties are fairly informed of the reasons driving a presiding officer's penalty assessment and that the presiding officer's reasons for the penalty assessment can be properly reviewed on appeal. Under the facts and circumstances of this case, the Presiding Officer's analysis concerning Marshall's culpability was sufficiently clear and detailed to satisfy the requirements of section 22.27(b).

(3) Notwithstanding the Board's determination that the Initial Decision generally conforms to the requirements of 40 C.F.R. § 22.27(b), the Board remands the case to the Presiding Officer to examine and explain whether the penalty calculation should be reassessed in light of the significant upward adjustment in the number of established violations found by the Presiding Officer, as reflected in an Errata issued after issuance of the Initial Decision.

Before Environmental Appeals Judges Scott C. Fulton, KathieA. Stein, and Edward E. Reich.

Opinion of the Board by Judge Fulton.

I. *INTRODUCTION*

Appellant, U.S. EPA Region V and EPA's Office of Regulatory Enforcement (collectively, the "Region"), appeals an Initial Decision issued by Administrative Law Judge William B. Moran ("Presiding Officer"), imposing upon Respondent, the City of Marshall, Minnesota ("Marshall" or "City"), a civil penalty of $6,000 for violations of section 309(g)(1)(A) of the Clean Water Act ("CWA"), 33 U.S.C. § 1319(g)(1)(A), arising from the application of sewage sludge to agricultural land in connection with the operation of a wastewater treatment plant.

The Region contends that the Presiding Officer erroneously reduced the $52,000 penalty it had proposed to $6,000 in contravention of provisions of the CWA and the consolidated rules of practice governing the administrative assessment of civil penalties at 40 C.F.R. part 22 ("Consolidated Rules"). The Region further contends that the Presiding Officer erred in finding that Marshall had sustained an affirmative defense under 40 C.F.R. § 22.24(b). Respondent does not appeal the Initial Decision.

II. *STATUTORY AND REGULATORY BACKGROUND*

This case is predicated on the standards embodied in 40 C.F.R. part 503, concerning the final use and disposal of sewage sludge[1] generated during the treat-

[1] Sewage sludge is defined in the regulations as "solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge." 40 C.F.R. § 503.9(w).

ment of domestic sewage[2] in treatment works.[3] *See* 40 C.F.R. § 503.1(a). The part 503 standards were promulgated pursuant to section 405 of the CWA, which required the Administrator to promulgate regulations to protect public health and the environment from reasonably anticipated adverse effects of certain pollutants in sewage sludge. CWA § 405(d), 33 U.S.C. § 1345(d).

The part 503 regulations were promulgated on February 19, 1993. *See* 58 Fed. Reg. 9248 (Feb. 19, 1993). The standards establish three specific methods for the final use and disposal of sewage sludge: (1) land application to agricultural and non-agricultural land;[4](2) placement in or on surface disposal sites;[5] and (3) incineration.[6]

Part 503 applies "to publicly and privately owned treatment works that generate or treat domestic sewage, as well as to any person who uses or disposes of sewage sludge from such treatment works." *Id.*; *see also* 40 C.F.R. § 503.1(b). This regulated community is required to comply with a number of different tasks, which include, for example, the sampling[7] and monitoring of certain pollutants,[8]record keeping,[9] reporting,[10] and adherence to specified management and operational practices.[11]

The standards identify certain pollutants for which monitoring is required and establish ceiling concentrations for those pollutants.[12] Of particular interest in this case is the ceiling concentration for molybdenum. According to the standards, sewage sludge should not be applied to land if the concentration of molyb-

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[2] The regulations define domestic sewage as "waste and wastewater from humans or household operations that is discharged to or otherwise enters the treatment works." 40 C.F.R. § 503.9(g).

[3] The term treatment works is defined as "either a federally owned, publicly owned, or privately owned device or system used to treat * * * either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature." 40 C.F.R. § 503.9(aa).

[4] *See* 40 C.F.R. §§ 503.10-.18.

[5] *See id.* §§ 503.20-.28.

[6] *See id.* §§ 503.40-.48.

[7] *See id.* § 503.8.

[8] *See id.* §§ 503.16, .26, .46.

[9] *See id.* §§ 503.17, .27, .47.

[10] *See id.* §§ 503.18, .28, .48.

[11] *See id.* §§ 503.14-.15, .24-.25, .44-.45.

[12] For instance, the standards provide numerical limits for pollutants such as arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc when sewage sludge is to be land-applied. *See* 40 C.F.R. § 503.13(b)(1)-(4).

denum in the sludge exceeds 75 milligrams per kilogram ("mg/kg"). 40 C.F.R. § 503.13(b)(1). In addition to identifying and establishing numerical limits for various pollutants, the standards also provide "pathogen and alternative vector attraction reduction requirements for sewage sludge applied to the land or placed on a surface disposal site."[13] 40 C.F.R. § 503.1(a); *see also* 40 C.F.R. §§ 503.15, .25, .30-.33.

Section 405(d)(2)(D) of the CWA establishes that the regulations to be developed by EPA were to be complied with "as expeditiously as practicable but in no case later than 12 months after their publication, unless such regulations require the construction of new pollution control facilities, in which case the regulations shall require compliance as expeditiously as practicable but in no case later than two years from the date of publication." CWA § 405(d)(2)(D), 33 U.S.C. § 1345(d)(2)(D). In keeping with this statutory mandate, the part 503 standards required compliance by February 19, 1994, exempting those facilities that needed to install new pollution control equipment and undergo construction from immediate compliance, and allowing them until February 19, 1995 — two full years — to achieve compliance. 40 C.F.R § 503.2(a). Specifically, section 503.2(a) provides as follows:

> Compliance with the standards [for the use or disposal of sewage sludge] shall be achieved as expeditiously as practicable, but in no case latter than February 19, 1994. *When compliance with the standards requires construction of new pollution control facilities*, compliance with the standards shall be achieved as expeditiously as practicable, but in no case later than February 19, 1995.

40 C.F.R § 503.2(a)(emphasis added).

III. *FACTUAL AND PROCEDURAL BACKGROUND*

Respondent owns and operates the Regional Waste Water Treatment Plant, a publicly owned treatment work ("POTW") located in the City of Marshall, Minnesota that generates sewage sludge during the treatment of domestic sewage. On September 28, 1998, Region V filed a complaint against Marshall alleging in three counts violations of 40 C.F.R. §§ 503.13(a), 503.8(a) and 503.15(a), and

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[13] The term "pathogen" is not defined in the regulations. Nonetheless, the regulations provide a definition for the term "pathogenic organisms." Pathogenic organisms are "disease causing organisms" which include, but are not limited to, "certain bacteria, protozoa, viruses, and viable helminth ova." 40 C.F.R. § 503.31(f). The term "vector attraction" is defined as "the characteristic of sewage sludge that attracts rodent, flies, mosquitos, or other organisms capable of transporting infectious agents. 40 C.F.R. § 503.31(k).

seeking a $54,000 penalty. *See* Complaint at 4-7. Specifically, the complaint alleged that: (1) Marshall land-applied sewage sludge containing molybdenum in excess of the ceiling concentration found at 40 C.F.R. § 503.13(a) on a total of 117 days between August 1994 and December 1996 ("Count I"); (2) Marshall did not analyze its sludge in accordance with the methods prescribed by EPA at 40 C.F.R. § 503.8(a) ("Count II"); and (3) Marshall land-applied sewage sludge without meeting the pathogen reduction requirements of 40 C.F.R. § 503.10(a) on a total of 10 days between February and March 1994 ("Count III"). Complaint at 4-6.

On April 12, 1999, the Region moved to amend the original complaint by withdrawing the second count, and proposed a penalty of $52,000 for the remaining two counts. Complainant's Motion to Amend and Withdraw Count (Apr. 12, 1999). The Presiding Officer dismissed the second count by order dated May 7, 1999. Order on Motions (ALJ, May 10, 1999).

Marshall answered the complaint on October 27, 1998, denying all allegations, asserting several affirmative defenses, and requesting a hearing. City of Marshall's Answer, Affirmative Defenses and Request for Hearing (Oct. 27, 1998). In a motion for accelerated decision, which was denied by the Presiding Officer,[14] Marshall argued that the violations addressed by the remaining counts in the complaint running from February 19, 1994, through February 19, 1995, should be excused by virtue of the deferred compliance date set forth at 40 C.F.R. § 503.2(a).[15] Respondent's Memorandum in Support of Motion for Accelerated Decision (Apr. 1, 1999).

The Presiding Officer held an evidentiary hearing on May 18, 1999. The parties concluded post-hearing briefing in August 1999. On October 3, 2000, the Presiding Officer rendered an Initial Decision, in which he found Marshall liable under Count I for violations of the land-applied sewage sludge requirements on 12

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[14] The motion for accelerated decision was denied because substantial issues of fact were in dispute warranting an evidentiary hearing. *See* Initial Decision at 1 n.3.

[15] As already explained, this provision extends the compliance date of all 40 C.F.R. part 503 standards to February 19, 1995 — two years after promulgation of the standards when compliance with the standards requires construction of new pollution control facilities. *See* 40 C.F.R. § 503.2(a).

days[16] between September 28, 1995, and November 7, 1995,[17] and dismissed the violations alleged under Count III occurring during February and March 1994 after determining that the defense provided by section 503.2(a) was applicable. Initial Decision at 15. The Presiding Officer reduced the Region's proposed penalty of $52,000 to $6,000.

On November 1, 2000, the Region filed a timely[18] notice of appeal, along with a motion for leave to seek reconsideration from the Presiding Officer and a motion to stay the appellate proceedings. The Region initially raised three issues in its notice of appeal: (1) that the Presiding Officer erred in making no determination on liability for 44 days on which there had been land application of sewage sludge containing metals in excess of the ceiling concentrations specified at 40 C.F.R. § 503.13(a); (2) that the Presiding Officer erred in neglecting to consider in his penalty assessment evidence relative to Respondent's culpability as

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[16] Under the CWA each day of violation is a separate violation, and each distinct violation is subject to a separate daily penalty assessment. *See* CWA § 309(d), 33 U.S.C. § 1319(d); *see also Borden Ranch P'ship v. U. S. Army Corps of Eng'rs*, 261 F.3d 810, 817 (9th Cir. 2001); *Atlantic States Legal Found., Inc. v. Tyson Foods, Inc.*, 897 F.2d 1128, 1139 (11th Cir. 1990); *Chesapeake Bay Found., Inc. v. Gwaltney of Smithfield, Ltd.*, 791 F.2d 304, 314-15 (4th Cir. 1986), *rev'd on other grounds*, 484 U.S. 49 (1987), *remanded*, 844 F.2d 170 (4th Cir. 1988), *judgment reinstated*, 688 F.Supp. 1078 (E.D.Va. 1988), *aff'd in part, rev'd in part on other grounds, and remanded*, 890 F.2d 690 (4th Cir. 1989).

[17] The complaint, by contrast, alleged that violations under Count I ran from August 1994 to December 1996 — a total of 117 days.

[18] The Region filed its notice of appeal 29 days after issuance of the Initial Decision. Section 22.30(a) of the Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties ("Consolidated Rules") establishes 30 days after the initial decision is served as the deadline for filing a notice of appeal of an initial decision. 40 C.F.R. § 22.30(a). This section was last amended on July 23, 1999, as part of the amendments to the Consolidated Rules. *See* 64 Fed. Reg. 40,138 (July 23, 1999). Prior to the amendments, section 22.30(a) provided 20 days to file a notice of appeal of an initial decision. The 1999 amendments to the Consolidated Rules became effective August 23, 1999, and apply "to all proceedings commenced on or after August 23, 1999." *Id.* Proceedings commenced before August 23, 1999, as is the case here, are also subject to the 1999 Consolidated Rules unless application of the rules "would result in substantial injustice." *Id.*

Marshall claims that the notice of appeal was untimely filed because the complaint, hearing, and briefing on this case were commenced before August 23, 1999. According to Marshall, the Region was required to file its notice of appeal within 20 days of the initial decision, as required by pre-1999 rules. Marshall does not, however, provide any convincing support for its argument that the application of the amended rule would result in a substantial injustice. Its only argument to sustain this claim is that "the entire hearing and briefing schedule was based upon the rules at the time, including the penalty calculation and provisions for the Initial Decision discussion of penalty factors" and to subject the Initial Decision to the requirements of the amended rules would "provide a substantial injustice to the City." Respondent's Brief at 2. We are not persuaded by this conclusory statement, in part because it completely disregards the fact that the Initial Decision here was issued a little over a year after the effective date of the new rules. Accordingly, we decline to apply the old 20-day filing rule and find Appellant's notice of appeal is to have been timely.

required by 40 C.F.R. § 22.27(b);[19] and that (3) the Presiding Officer erred in applying the defense provided by 40 C.F.R. § 503.2(a) under the facts contained in the record. Notice of Appeal at 1.

On November 15, 2000, the Presiding Officer issued an Errata "clarifying" the number of violations established under Count I. *See* Errata issued by the Administrative Law Judge William B. Moran (Nov. 16, 2000) at 1 ("Errata"). The Presiding Officer explained that his determination regarding the number of established violations should be revised to read, "the instances of recognizable violations within Count I are reduced to include only those loads of land-applied sewage occurring from *February 20, 1995 through December 1996*, while the violations alleged for Count III, occurring during February and March 1994, are dismissed." *Id.* The Errata notes that, given that the period of violation recognized by the Errata is longer than that contemplated by the Initial Decision, the proper number of days of violation is 56 instead of the 12 days of violation referenced in the Initial Decision. *Id.*

On November 30, 2000, the Board issued an order denying Appellant's motion to stay the appellate proceedings, directing Appellant to file a brief in support of its notice of appeal by December 20, 2000, and indicating that the first issue raised by the Region on its notice of appeal was now moot as a result of the Errata. Order Denying Stay of Proceedings (EAB, Nov. 30, 2000). The Region filed a timely brief ("Appellant's Brief"), and on January 11, 2001, Marshall filed its reply brief ("Respondent's Brief").[20]

The Region's appeal of the Initial Decision is thus now limited to the Presiding Officer's penalty assessment and the applicability of the defense provided in section 503.2. Our discussion below focuses on the issue of the defense first, followed by our consideration of the penalty assessment. As discussed, we affirm the Presiding Officer's decision regarding Marshall's affirmative defense for those violations alleged to have occurred between February 19, 1994, and February 19, 1995, but nonetheless remand the matter to the Presiding Officer for reconsideration of the penalty assessment.

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[19] The notice of appeal referred originally to section 22.27(a), instead of 22.27(b). The Region has moved to amend the notice of appeal to reference section 22.27(b) on the ground that the citation to section 22.27(a) had been a typographical error. *See* Appellant's Brief at 1 n.2. Because an error of this nature is harmless and we adhere to the generally accepted legal principle that "administrative pleadings are liberally construed and easily amended," we will read the notice of appeal as referring to section 22.27(b). *See, e.g., In re Port of Oakland*, 4 E.A.D. 170, 205 (EAB 1992).

[20] On January 30, 2001, the Region filed a motion for leave to file a response brief and a request for oral argument. By motions dated February 5, 2001, and May 16, 2001, Respondent opposed both requests. Upon consideration of Appellant's and Respondent's motions, we find that neither of Appellant's requests will materially assist the Board in resolving this matter. Therefore, Appellant's requests to file a response brief and for oral argument are denied.

IV. *DISCUSSION*

A. *Standard of Review*

In an enforcement proceeding like the one at hand, the Board reviews a presiding officer's factual and legal conclusions *de novo*. 40 C.F.R. § 22.30(f) (conferring authority on the Board to "adopt, modify, or set aside the findings of fact and conclusions of law or discretion contained in the decision or order being reviewed"); *In re Billy Yee*, 10 E.A.D. 1, 10 (EAB 2001); *see also, In re H.E.L.P.E.R., Inc.*, 8 E.A.D. 437, 447 (EAB 1999). Nonetheless, the Board has stated on various occasions that it will generally give deference to a presiding officer's findings of fact based upon the testimony of witnesses because the presiding officer has the opportunity to observe witnesses and evaluate their credibility. *See. e.g., In re Tifa Ltd.*, 9 E.A.D. 145, 151 n.8 (EAB 2000); *In re Port of Oakland*, 4 E.A.D. 170, 193 n.59 (EAB 1992).

The complainant has the burdens of persuasion and presentation to prove that "the violation occurred as set forth in the complaint and that the relief sought is appropriate." 40 C.F.R. § 22.24(a); *In re LVI Envtl. Servs., Inc.*, 10 E.A.D. 99, 101 (EAB 2001). Once the complainant establishes a *prima facie* case, the burdens shift to the respondent to present "any defense to the allegations set forth in the complaint and any response or evidence with respect to the appropriate relief. The respondent has the burdens of presentation and persuasion for any affirmative defenses." 40 C.F.R. § 22.24(a); *In re Rogers Corp.*, 9 E.A.D. 534, 555-56 (EAB 2000).

In carrying the burden of proof, the parties are subject to a "preponderance of the evidence" standard. 40 C.F.R. § 22.24(b). The phrase "preponderance of the evidence" means "the greater weight of the evidence; superior evidentiary weight that, though not sufficient to free the mind wholly from all reasonable doubt, is still sufficient to incline a fair and impartial mind to one side of the issue rather than the other." Black's Law Dictionary 1201 (7th ed. 1999); *see also In re Bullen Companies, Inc.*, 9 E.A.D. 620, 632 (EAB 2001). On several occasions the Board has noted that "'the preponderance of the evidence standard means that a fact finder should believe that his factual conclusion is more likely than not.'" *In re Ocean State Asbestos Removal, Inc.*, 7 E.A.D. 522, 530 (EAB 1998) (citing *In re Great Lakes Div. of Nat'l Steel Corp.*, 5 E.A.D. 355, 363 n.20 (EAB 1994) (preponderance of the evidence means that a fact is more probably true than untrue)).

With these considerations as background, we will now proceed to the analysis of the issues raised on appeal.

B. *Whether the Record Supports the Presiding Officer's Decision to Uphold Marshall's Defense Under 40 C.F.R. § 503.2(a)*

1. *Marshall's Arguments Before the Presiding Officer*

In the proceedings before the Presiding Officer, Marshall raised the defense found at 40 C.F.R. § 503.2(a), which, as already explained, exempted regulated industries whose compliance with part 503 required construction of new pollution control facilities from compliance with the new sludge standards for an additional year after the otherwise applicable regulatory deadline. According to Marshall, Respondent's POTW underwent construction of "new pollution control facilities" in order to achieve compliance with the new regulations. Respondent's Memorandum in Support of Motion for Accelerated Decision (Apr. 1, 1999) at 3. Marshall supported its arguments with evidence that it spent $5.2 million on facility improvements which "were not completed until the very end of 1994." *Id.* At the evidentiary hearing, Marshall presented testimony of various witnesses who attested that Respondent had been fully aware of the upcoming sludge regulations and that the decision had been made to undergo construction at the facility in part to achieve compliance with the standards. Of interest here is the testimony offered by Robert Byrnes, Mayor of Marshall, and Keith Nelson, City Engineer and Director of Public Works for the City of Marshall.

Under questioning by Marshall's counsel, Robert Byrnes indicated that the plant upgrades were undertaken, in part, in anticipation of the new sludge regulations:

> Q. Prior to 1996 had the City of Marshall taken any efforts concerning their wastewater treatment plants? What efforts had taken place to date prior to 1996?
>
> A. Right. We were involved in an upgrading of our wastewater plant in fact I believe in 1994 we employed an engineering consulting firm of RMC to improve our wastewater treatment plant, not only the capacity but also in anticipation of the pending regulations so that we were sure that our plant was up to speed.
>
> Q. Okay. And so prior to 1996 you personally and City of Marshall had some general awareness of changes in environmental protection regulations that would impact you?

A. Right. Right. In fact, let me correct. I think I said 1994. When we did that [plant upgrade] that was in 1992."

* * * * * * *

Q. Referring your attention to the 1992 city council minutes, what is contained in the minutes that directly impacts the issue here today?

A. This was — couple of things. First off [sic] this was on the agenda or a report from Mike Zagar who was the consulting engineer with the firm RMC on the wastewater facilities plan. Reporting to the city council he indicated that the wastewater treatment facility has had good past performance but is growing old and that the Minnesota Pollution Control Region is imposing additional standards and the community is growing residentially, commercially, and industrially and based on that he was recommending that we go through a comprehensive construction project to bring that plant up to speed.

Q. An the city was aware that EPA was in the process off [sic] enacting new sludge rules, is that correct?

A. We were aware that there was new standards that would be coming.

Hearing Transcript ("Tr.") at 154, 156-57.

In addition, Keith Nelson testified concerning those aspects of the construction project aimed to ensure compliance with the new sludge standards. In particular, Mr. Nelson mentioned the construction of trickling filters[21] and activated

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[21] In his testimony, Mr. Nelson explained the function that trickling filters play at Marshall's POTW:

Q. What is a trickling filter?

A.

Continued

sludge basins, which according to his testimony, help reduce the quantities of sludge that go into the plant's anaerobic digesters, thereby improving the plant's ability to control pathogens.[22]

> Q. [W]hat specific areas of the construction directly helped the City be in compliance with their sludge management and pathogen reduction programs?
>
> A. Both the construction of the trickling filters and the activated sludge basins would help reduce the quantities of sludge that would go to the anaerobic digesters in reducing the quantities we could increase the times and the temperatures.[23]
>
> Q. Would the City have had any reason to incur that expense but for their desire to be in compliance with EPA regulations?

(continued) Trickling filter is near the beginning of the process. It's a process of running the water over a medium which has growth on it which helps break down solids which helps lower the BOD requirements. It's a more efficient process than our old process of lagoons and it's less solids we talked about earlier. Beyond that we have the activated sludge chambers that are again the same process, there is a combination of bacteria growth in it as well as the air input into the process. We had an additional clarifier that was put in. We had some prescreening grit removal material and there was a splitter box, just some operative improvements as well.

Tr. at 187.

[22] *See also* Joint Stipulations of Fact and Stipulated Exhibits ("JX") 30 (Affidavit of Robert Vanmoer, superintendent for Marshall's waste water treatment facility, indicating that the process improvements have lowered the quantity of sludge production at the POTW, and that such reductions have consequently resulted in improved pathogen and vector attraction reductions).

[23] According to the testimony offered by Mr. Nelson and Robert Vanmoer's affidavit, the temperature increase resulting from the installation of trickling filters has resulted in better control of pathogens. *See, e.g.*, JX 30 ("As a result of the construction undertaken at the Marshall Wastewater Treatment Facility, completed on December 1994, the facility has seen a reduction in loading and biosolids [sludge] production, which has had a direct impact on retention times and temperatures in the anaerobic digester system. These improvements have resulted in improved pathogen and vector attraction reductions in order to comply with 503 regulations.").

A. That is part of the reason. The other reason would be to increase capacity of the plant.

Tr. at 178.

Because it purportedly believed in good faith that construction was necessary to achieve compliance with the part 503 standards, and such construction was, in fact, undertaken, Marshall submits that it was entitled to the one-year compliance extension provided by 40 C.F.R § 503.2(a). *See* City of Marshall's Post-Hearing Memorandum at 19-21; Respondent's Post-Hearing Reply Brief at 9; Initial Decision at 7.

2. *Region's Arguments Before the Presiding Officer*

In the Region's view, the defense provided under 40 C.F.R. § 503.2(a) did not apply to Marshall because it only operates where compliance cannot be achieved by any means other than construction of new facilities. According to the Region, "the defense provided by 40 C.F.R. § 503.2(a) requires a respondent to demonstrate that it had absolutely no other alternative besides land application in violation of part 503 standards until Respondent completed construction of pollution control equipment." Complainant's Reply to Respondent's Motion for Accelerated Decision at 5. The Region claimed that in this case non-construction options for sludge disposal were available, such as storage, incineration, surface disposal, and landfilling. Thus, according to the Region, the defense should not apply. Complainant's Reply to Respondent's Motion for Accelerated Decision at 6-8; Complainant's Post Hearing Brief at 30; Initial Decision at 8. The fact that Marshall did not in fact achieve compliance with the pathogen reduction requirements immediately after construction, is further indication, in the Region's opinion, that construction was not the optimal strategy for achieving compliance. *See* Complainant's Post-Hearing Brief at 21-23; Initial Decision at 8-9.

3. *Presiding Officer's Findings*

In his Initial Decision, the Presiding Officer found that there was unrefuted evidence that Marshall determined, upon consultation with engineers, that construction of new pollution control facilities was required. Initial Decision at 14. In particular, the Presiding Officer pointed to evidence that: (1) Marshall had consulted with engineers who recommended the construction of new facilities as a means of meeting Marshall's sludge-related regulatory obligations;[24] (2) Marshall

[24] The record shows that early on, before the promulgation of the new sludge standards, Marshall made the decision to invest in plant upgrades and modifications. *See* JX-24 (City Council's Minutes, Regular Meeting Apr. 20, 1992). One of the considerations as reflected in the record, for the installation of new pollution control facilities, was the imminent upcoming of new sludge standards.
Continued

spent $5.2 million in projects to upgrade the facility, which shows that the construction was not just a subterfuge to avoid being cited for violations for a year; and (3) as part of the project Marshall installed trickling filters which affected sludge production and pathogen reduction. *Id.* at 14-15.

The Presiding Officer also rejected the Region's argument that section 503 should be limited to those circumstances in which a facility can demonstrate the efficacy of a construction-based control strategy by coming into immediate compliance after construction. *Id.* at 14. Observing that such a requirement would be unreasonable considering that ordinarily post-construction adjustments and fine-tuning are necessary before achieving operational success, the Presiding Officer concluded that Marshall was entitled to the one-year extension in view of its good faith reliance on the civil engineers' advice. *See id.*

4. *Region's Arguments on Appeal*

On appeal, the Region argues that the Presiding Officer erred in adopting an overbroad, "global" interpretation of the term "required," as used in section 503.2, which led him to incorrectly conclude that Marshall had established a *prima facie* case for application of the defense. Appellant's Brief at 15-16. In general, the Region's arguments are that Marshall did not show that non-construction strategies for controlling sludge were unavailable and likewise failed to show that the principal purpose of the construction project was to achieve compliance with the sludge regulations. According to the Region, the most likely intent of the construction project was to accommodate city expansion rather than managing sludge. *Id.* at 16-18.

The Region argues that even if the Presiding Officer was correct in concluding that Marshall had made a *prima facie* case for the application of the defense, he erred in concluding that Marshall had sustained its ultimate burden of persuasion in view of countervailing evidence in the record. In particular, the Region points to the fact that Marshall did not achieve compliance immediately after construction as evidence not only that construction was not required, but that it was a

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(continued)
In the midst of all the interests the plant upgrade was intended to serve, the City recognized the potential impact of the new regulations, and its necessity to upgrade its facility if it wanted to be able to comply. *Id.* ("Mr. Zagar [consultant engineer] indicated that the Wastewater Treatment Facility has had good past performance, is growing old, that the Minnesota Pollution control Region is imposing additional standards and that the community is growing residentially, commercially and industrially. The alternatives to the improvement * * * include an upgrading of the existing system * * *, to use a single state process * * *, or a two stage process (trickling filter/activated sludge process). Mr. Zagar indicated that the sludge project from 1988 looks ok but that it should be checked after the new EPA Sludge Rules."). Moreover, the testimony offered by Robert Byrnes, Mayor of Marshall, showed that compliance with the new sludge regulations was one of the concerns and main purposes of the construction. *See* Tr. at 154, 156-57.

less effective strategy for attaining compliance with part 503 than other sludge disposal options — options which, according to the Region, Marshall did not consider. *Id.* at 20-22.

5. *The Presiding Officer Did Not Err in Finding that Marshall Had Established a Section 503.2(a) Defense*

The Region's interpretation of the reference in the regulations to "requires" strikes us as overly restrictive and absolute. In the Region's view, to invoke the section 503.2(a) defense, one has to show that there was "absolutely no other alternative" to construction as a means of controlling sludge. Complainant's Reply to Respondent's Motion for Accelerated Decision at 5. Since the other forms of disposal sanctioned by the regulations — incineration, off-site disposal at an approved sludge disposal facility, and off-site disposal at a landfill — would appear to be at least theoretically available in most circumstances, it is difficult to discern a circumstance in which there would be "absolutely no other alternative" to construction for addressing sludge disposal. We are disinclined to construe the term "requires" in a way that would effectively render the section 503.2(a) defense meaningless. *See Connecticut Nat'l Bank v. Germain*, 503 U.S. 249, 253 (1992)("courts should disfavor interpretations of statutes that render statutory language superfluous"); U.S. v. Talley, 16 F.3d 972, 976 n.7, (8th Cir. 1994)("It is an elementary rule of construction that effect must be given, if possible, to every word, clause and sentence of a statute."); *see also In re City of Moscow*, 10 E.A.D. 135, 143 (EAB 2001) (same rules of construction apply to administrative regulations as apply to statutes)(citing *Rucker v. Wabash R.R. Co.*, 418 F.2d 146, 149 (7th Cir. 1969)).

Significantly, dictionary definitions of "require" contain considerably more texture than the stark interpretation advanced by the Region. The Merriam-Webster's Collegiate Dictionary defines "require" in this setting to mean "to seek for, need" or "to call for as suitable or appropriate." Merriam-Webster's Collegiate Dictionary 995 (10th ed. 1999). Webster, for its part, defines "require" as "to call for as suitable or appropriate in a particular case," or "need for some end or purpose." Webster's Third New International Dictionary 1929 (1993). We find the idea of "appropriateness" embedded in these definitions to be especially instructive for purposes of the interpretive challenge at hand. From this vantage point, we think the question posited by section 503.2(a) is not whether construction was the only option but rather whether it was, under the circumstances, the most appropriate alternative. Moreover, we do not think the question whether construction served a purpose beyond sludge control cuts against Marshall in determining the appropriateness of construction as a means of addressing the sludge regulations. We find nothing in the regulation that supports the Region's suggestion that construction projects with a dual purpose, such as facilitating expansion while at the same time addressing sludge concerns, cannot qualify as a circumstance which "requires" construction.

We also disagree with the Region regarding the temporal focus of the proof needed to substantiate a claim that construction was required to comply with the regulations. The Region argues that we should give significant weight to the fact that construction did not, in fact, result in immediate compliance upon completion. According to the Region, Marshall did not achieve compliance with the molybdenum concentration limit until December 1996, while the construction projects were completed sometime during December 1994. *See* Appellant's Brief at 20. To the Region's way of thinking, this indicates that construction was not the most efficacious way to achieve compliance with the sludge regulations and that other options should have been pursued. While such considerations may not be altogether irrelevant to the inquiry, we share the Presiding Officer's view that the more important question is whether, at the time that the decision was made to pursue construction as a pollution control strategy, Marshall had an objective, good faith basis for believing that construction was the appropriate strategy. In answering this question, consideration of the extent to which construction ultimately turned out to be successful is of limited value.[25]

In sum, and based on the foregoing, we find no basis for disturbing the Presiding Officer's determination that, under the facts of this case, Marshall satisfied the elements of the defense provided by 40 C.F.R. § 503.2(a).

B. *Penalty Assessment*

In its appeal the Region contends that the Presiding Officer neglected the requirements of 40 C.F.R. § 22.27(b) by failing to explain *in detail* in his decision how the penalty assessed corresponds to the penalty criteria set forth in section 309(g)(3) of the CWA. Appellant's Brief at 5. Specifically, the Region argues that the Presiding Officer did not adequately address Marshall's "culpability" — one of the factors enumerated in the Act. *Id.* Given this alleged shortcoming, the penalty assessment, in the Region's view, lacks the element of deterrence contemplated by EPA's civil penalty policies.[26] Appellant's Brief at 23-24.

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[25] Moreover, we share the Presiding Officer's concern that if the Region's argument were accepted, it might have the effect of denying coverage to many of the facilities that undertook construction as a means of meeting sludge management responsibilities, in view of the typical need for post-construction adjustments and assessments to bring newly installed facilities into optimal operational conditions. *See* Initial Decision at 14.

[26] The Region references *A Framework for Statute-Specific Approaches to Penalty Assessments: Implementing EPA's Policy on Civil Penalties* ("EPA General Enforcement Policy #GM-22") (Feb. 16, 1984), which recognizes deterrence as one of the key goals in penalty determination. EPA General Enforcement Policy #GM-22 is one of the two general policies on civil penalties frequently used in the assessment of penalties. In the Region's view, the penalty assessed in this particular case "serves not as a penalty to effectively deter future violations, but as a user fee, and consequently a cost of doing business." Appellant's Brief at 2.

Our analysis begins with the statute itself. Section 309(g)(3) of the CWA sets forth the following criteria for the assessment of administrative civil penalties:

> [T]he nature, circumstances, extent and gravity of the violation, or violations, and, with respect to the violator, ability to pay, any prior history of such violations, the degree of culpability, economic benefit or savings (if any) resulting from the violation, and such other matters as justice may require.

CWA § 309(g)(3), 33 U.S.C. § 1319(g)(3).

Section 22.27(b) of the Consolidated Rules, for its part, directs the Presiding Officer to "explain *in detail* in the initial decision how the penalty to be assessed corresponds to any penalty criteria set forth in the Act." 40 C.F.R. § 22.27(b) (emphasis added). In addition, section 22.27(b) establishes that "[i]f the Presiding Officer decides to assess a penalty different in amount from the penalty recommended to be assessed in the complaint, the Presiding Officer shall set forth in the initial decision the specific reasons for the increase or decrease." *Id.*

In view of the highly discretionary nature of penalty assessment, the requirement that a presiding officer provide a detailed discussion of how the applicable statutory penalty criteria relate to the assessed penalty serves the purposes of ensuring both that interested parties are fairly informed of the reasons driving the presiding officer's penalty assessment and "that the (presiding officer's) reasons for the penalty assessment can be properly reviewed on Appeal". *In re Britton Constr. Co.*, 8 E.A.D. 261, 282 (EAB 1999). *See In re Pepperell Assocs.*, 9 E.A.D. 83, 107 (EAB 2000) (stating that section 309 does not prescribe a precise formula by which penalty factors must be computed); *see also Tull v. United States*, 481 U.S. 412, 426-27 (1987)("highly discretionary calculations that take into account multiple factors are necessary in order to set civil penalties under the [CWA]").[27] In this vein, we have observed that we should not have to "engage in conjecture * * *in order to discern a Presiding Officer's reasons for deviating from a recommended penalty." *In re EK Assocs., L.P.*, 8 E.A.D. 458, 474-75 (EAB 1999); *In re Pacific Ref. Co.*, 5 E.A.D. 607, 613 n.7 (EAB 1994).

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[27] The preamble to the amendments of 40 C.F.R. § 22.27 indicates that the obligation to explain in detail how the penalty corresponds to the penalty criteria of the Act is not limited to circumstances where the Presiding Officer assesses a penalty different from that in the complaint. 64 Fed. Reg. 40,138, 40,166 (July 23, 1999).

While the Presiding Officer must consider the complainant's penalty proposal, he or she is not constrained by it, even if that proposal is shown to have "take[n] into account" each of the prescribed statutory factors. *In re Employer's Ins. of Wausau*, 6 E.A.D. 735, 758 (EAB 1997). Rather, if the Presiding Officer chooses not to assess complainant's recommended penalty, the Presiding Officer need only explain the basis for that choice in the initial decision. *Id.* Of course, the Presiding Officer must also ensure that the penalty he or she ultimately assesses reflects a reasonable application of the statutory penalty criteria to the facts of the particular case. *Id.*

In the present case, the Region requested a total penalty of $52,000 for the two counts of the amended complaint. Although the proposed penalty was stated as an aggregate penalty for the two violations (i.e., the Region did not specify an amount for each penalty criterion for each count, nor did it subdivide the overall amount between the two counts), in its proposed penalty analysis the Region provided a discussion relating each one of the statutory penalty criteria to the facts in the record. *See* Complainant's Post-Hearing Brief at 24-33.

The Presiding Officer responded by assessing a total penalty of $6,000 for the two counts. In his penalty assessment, the Presiding Officer did not deploy either of two penalty policies often used in situations like the one at hand — where no statute-specific penalty guidance is available.[28] *See* Initial Decision at 15. The Presiding Officer rather restricted his analysis to the consideration of the statutory penalty factors.[29]

As stated in the Initial Decision, the Presiding Officer's penalty determination was based on his previous conclusion with regard to section 503.2(a). *Id.* ("[A]s a consequence of the Section 503.2(a) defense, only twelve instances of land applied sewage sludge are recognizable violations.").[30] With this as a predicate, the Presiding Officer began his analysis by referencing the statutory factors.

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[28] EPA has not developed a penalty policy specific to the CWA. However, as explained *supra*, in assessing penalties, the Agency often relies for guidance on EPA's two general penalty policies: the *Policy on Civil Penalties* ("EPA General Enforcement Policy #GM-21")(Feb. 16, 1984) and EPA General Enforcement Policy #GM-22.

[29] We have previously held that this falls within the reasonable exercise of the Presiding Officer's discretion. While the regulations governing this proceeding require that presiding officers consider any relevant civil penalty policies in reaching their penalty determinations, *see* 40 C.F.R. § 22.27(b), they are not required to adhere to such policies, since the policies, not having been subjected to the rulemaking procedures of the Administrative Procedure Act, lack the force of law. *In re Wallin*, 10 E.A.D. 18, 25 n.9 (EAB 2001); *see also In re B & R Oil Co.*, 8 E.A.D. 39, 63 (EAB 1998); *In re Employer's Ins. of Wausau*, 6 E.A.D. 735, 758 (EAB 1997).

[30] As already explained, the Presiding Officer eventually clarified that the 12 days of violations under Count I referenced in the Initial Decision was a clerical error and 56 was the proper number of violations.

He then discussed the evidence in the case pertaining to the issue of penalty, ultimately concluding that a penalty of $6,000 was appropriate. *Id.*[31]

On appeal, the Region challenges the Presiding Officer's penalty assessment as deficient in its analysis of the statutory factors, and, in particular, of the culpability factor. In the Region's view, the Presiding Officer's analysis in this regard is not sufficiently detailed and therefore does not conform to section 22.27(b) requirements.[32]

While it is true that the Presiding Officer's decision does not discuss all of the evidence on a factor-by-factor basis, and that the analysis of culpability-related evidence is thus not organized around an explicit reference to culpability, it seems fairly plain that the Presiding Officer did, in fact, consider and factor into his penalty assessment evidence in the record bearing on the issue of culpability.[33] To the point, based on the evidence adduced at trial, the Presiding Officer fairly clearly rejected the Region's argument that Marshall had acted in dereliction of its regulatory obligations and rather concluded that the City had exercised good faith and diligence in attempting to respond to its regulatory challenges.

While we grant that the Presiding Officer's analysis of the culpability factor might have been clearer had he organized his discussion of the evidence relating

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[31] The Presiding Officer further indicated that "even if it had been determined that the Section 503.2 defense was inapplicable, the court would have departed from the penalty proposed." Initial Decision at 15.

[32] It bears noting that the "explain in *detail*" requirement of section 22.27 is a relatively recent addition to the rule. Section 22.27(b) was last amended on July 23, 1999, as part of the amendments to the Consolidated Rules. *See* 64 Fed. Reg. at 40,166. Prior to the amendments, section 22.27(b) read as follows:

> If the Presiding Officer determines that a violation has occurred, the Presiding Officer shall determine the dollar amount of the recommended civil penalty to be assessed in the initial decision in accordance with any criteria set forth in the Act relating to the proper amount of a civil penalty, and must consider any civil penalty guidelines issued under the Act. If the Presiding Officer decides to assess a penalty different in amount from the penalty recommended to be assessed in the complaint, the Presiding Officer shall set forth in the initial decision the specific reasons for the increase or decrease.

[33] Throughout his opinion the Presiding Officer makes reference to indicia of Marshall's good faith and cooperative behavior. *See* Initial Decision at 14, 16-17 (references to Marshall's reliance on the advice of consultant engineers, and cooperation with EPA throughout the proceedings). Moreover, there is explicit discussion of evidence bearing on the question of culpability. For example, the Presiding Officer indicated that Marshall "should have waited for the lab results before applying the sludge to land; to do otherwise renders the regulation a nullity." *Id.* at 16. The Presiding Officer also observed that "[s]uggestions by EPA that the City intentionally or recklessly disregarded the AO are unfair characterizations, unsupported by the record." *Id.*

to culpability more clearly around the culpability factor, this is not a case in which we have to strain or engage in conjecture to determine how the Presiding Officer addressed this factor.

In sum, based on our review of the Initial Decision, and under the facts and circumstances of this case,[34] we conclude that the Presiding Officer's analysis concerning Marshall's culpability satisfies the requirements of section 22.27(b) and its underlying principles. The Presiding Officer analyzed the evidence submitted at the hearing, reasonably applied the statutory penalty criteria, and adequately explained his reasons for departing from the penalty proposed by the Region.

Here, based on the testimony and evidence adduced at the evidentiary hearing, the Presiding Officer concluded that Marshall, in determining that construction was required, acted in good faith reliance on the civil engineers' advice. *See* Initial Decision at 14. As already stated, we generally give deference to findings of fact based on testimonial evidence received at trial. *See supra* section IV.A. We see no basis for departing from that practice here. Accordingly, we uphold the Presiding Officer's conclusion that Marshall met both its initial burden of presentation and its ultimate burden of persuasion in establishing a defense under 40 C.F.R. § 503.2(a).

However, while we find no error in the Presiding Officer's analysis of the statutory factors, remand is nonetheless necessary. The Region correctly points out that while the Errata served to increase the number of instances of violation from 12 to 56, the Presiding Officer did not explain how this adjustment affected his penalty analysis. At the very best, the Errata intimates that no further changes to the Initial Decision are required. Errata at 1 ("[A] reading of the decision as a whole makes it clear that all charged instances were considered."). Given, however, that the difference between 12 violations and 56 violations — a nearly five-fold increase — is hardly immaterial, we think *explicit* consideration of the

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[34] We note that this is not a case in which the Region provided the Presiding Officer a detailed or itemized penalty analysis. There was not, for example, a specific penalty number proposed in conjunction with the culpability factor. Rather, as stated, the Region came up with an aggregate penalty number based on the totality of the relevant considerations. *See* Tr. at 115-16 (testimony of Mr Aistairs, EPA's Region 5 sludge program manager, on the proposed penalty); Complainant's Post Hearing Brief at 24-33; *see also* Initial Decision at 15 ("Further, the Court notes that the record contains no evidence of EPA's allocation of penalty amounts ascribed for each statutory criterion for each Count * * *. Nor was there particular administrative certainty that the $54,000 originally sought was correct. As Mr. Aistairs explained, he inherited the file and the proposed penalty figure from another. When asked if he would reach the same valuation for the penalty he responded: 'I may have and may not have'."). In our view, the level of analytical precision expected of presiding officers is not unrelated to the level of precision inherent in the Region's proposed penalty in the first instance. In a case like the one at hand, where the proposed penalty was itself somewhat summary, we think the Presiding Officer's analysis was sufficiently detailed.

impact of the adjustment on the penalty assessment is warranted and, therefore, remand this penalty assessment for this limited purpose.

IV. *CONCLUSION*

As discussed above, we uphold the Presiding Officer's conclusion that Marshall was entitled to the extended compliance schedule set forth in 40 C.F.R. § 503.2(a), and find that the Initial Decision conforms to the requirements of section 22.27(b). Nevertheless, we remand the case to the Presiding Officer to examine and explain whether the penalty calculation should be reassessed in light of his upward adjustment in the number of identified violations. The Presiding Officer's decision on remand setting forth the amount of the penalty to be assessed against Marshall shall be appealable to this Board — only if limited to the issue on remand — pursuant to 40 C.F.R. § 22.30.

So ordered.

BIOGRAPHICAL SKETCH

MR. THOMAS MENKE has been intricately involved at the state and national level on issues centering on agriculture's relationship to the environment. He provides a well-rounded perspective due to his studies and experiences with the interrelationships between soil fertility, crop production, water quality, animal husbandry, farm management and social issues concerning modern agriculture. Mr. Menke lends a unique viewpoint to agriculture issues through his expertise in management systems and farm level practicality. He has designed and implemented innovative systems to assist farms with compliance with nutrient management and water quality requirements.

- President of Menke Consulting, Inc., Greenville, Ohio - an agronomic and environmental management consulting firm specializing in agricultural production systems concerning nutrient and water quality management since 1977, providing services that include soil testing and crop fertility recommendations on over 100,000 acres annually.
- Has successfully prepared many nutrient management plans and livestock facility permits as required by state and federal regulatory agencies in several Midwestern states, with many efforts focused in Ohio, which is a priority state facing rural-urban interface issues and with the most rigorous livestock management regulations in the United States.
- Provides professional advice annually to and the monitoring of over 400 grain, livestock and poultry operations.
- Other clients include farm residual nutrient recycling businesses and municipalities for biosolids management.

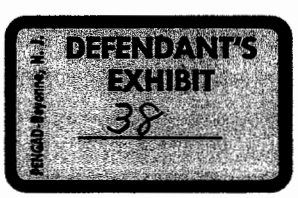
Mr. Menke is actively involved at the state and local level on behalf of agriculture:

- Environmental and nutrient management best management practices and legislative committees.
- Manure treatment and storage design criteria committees, and the design of new manure management processes.
- He has served on the National Pork Producer Council's (NPPC) Environmental Assurance Task Force, which developed the national NPPC Environmental Assurance Program.
- Mr. Menke has been responsible for conducting many of the NPPC Environmental Assurance Program sessions in Ohio and assisting with several of the Ohio Livestock Environmental Assurance Programs educational presentations.
- He is the author of segments of the NPPC Environmental Assurance Program training manual.
- He was co-chair of the acceptable management practices committee of the Ohio Livestock Industry Task Force Work Group whose goal was to address agricultural viability in Ohio in light of current public issues, and
- Has served on the USDA Natural Resources Conservation Service's Ohio Manure and Nutrient Management Plan Committee as well as currently on the Ohio Livestock Coalition's Producer Education and Legislative Committees.

Mr. Menke is also a member of the Brookside Society of Professional Consultants, a network of agricultural and environmental consultants practicing throughout the U.S. and several other countries. He also serves as a board director of Brookside Laboratories, Inc., an agricultural and environmental laboratory with worldwide credentials.

PROFESSIONAL MEMBERSHIPS:

- Certified Professional Crop Consultant - Independent - Cert. No. 0023
- National Alliance of Independent Crop Consultants
- American Society of Agricultural Engineers
- Soil and Water Conservation Society



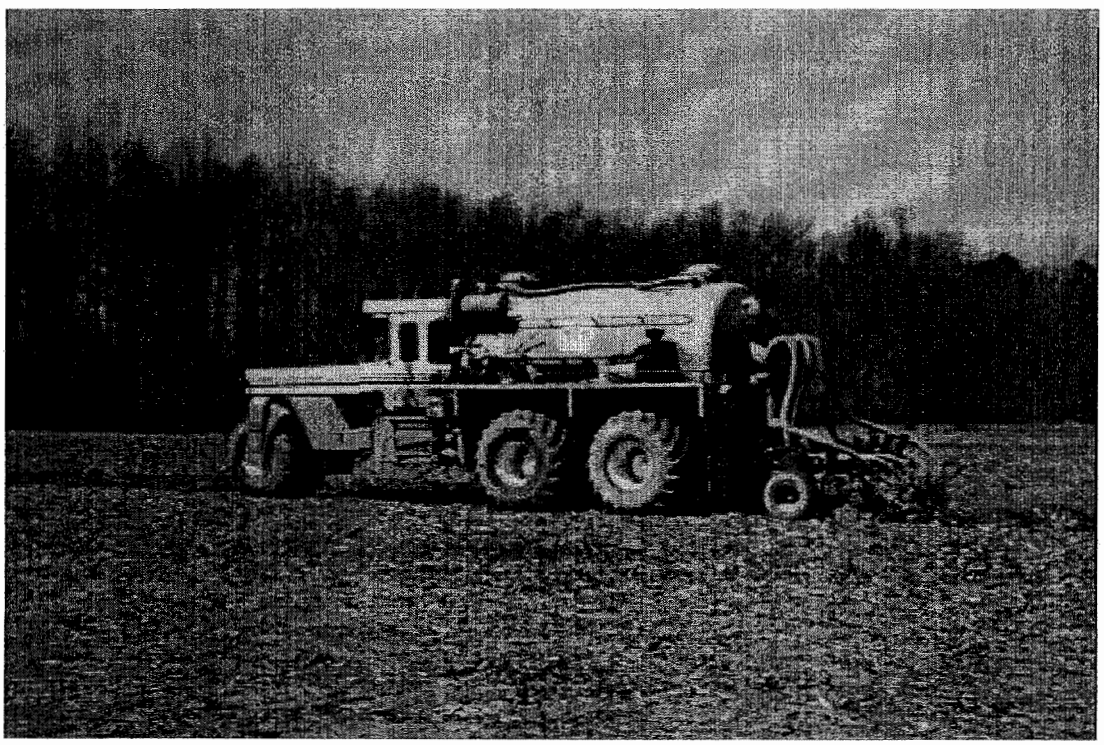
Office of Inspector General

Status Report

Land Application of Biosolids

2002-S-000004

March 28, 2002



Inspector General Resource Center Conducting the Review	**Headquarters Audit/Evaluation Resource Center Washington, DC**
Program Offices Involved	**Office of Water**
	Office of Research and Development
	Office of Enforcement and Compliance Assurance

Abbreviations

DMT:	Dry Metric Ton
EMS:	Environmental Management System
EPA:	U.S. Environmental Protection Agency
EQ:	Exceptional Quality
FTE:	Full-Time Equivalent
OECA:	Office of Enforcement and Compliance Assurance
OIG:	Office of Inspector General
STP:	Sewage Treatment Plant
WEF:	Water Environment Federation
WERF:	Water Environment Research Foundation

Front Cover Photograph: Biosolids being applied to land. Photograph by OIG staff.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

OFFICE OF
INSPECTOR GENERAL

March 28, 2002

MEMORANDUM

SUBJECT: Status Report: Land Application of Biosolids
Report No. 2002-S-000004

FROM: Judith J. Vanderhoef, Project Manager
Headquarters Audit/Evaluation Resource Center (2443)

TO: G. Tracy Mehan, III
Assistant Administrator for Water (4101M)

Sylvia K. Lowrance
Acting Assistant Administrator
for Enforcement and Compliance Assurance (2201A)

Henry L. Longest, II
Acting Assistant Administrator
for Research and Development (8101R)

Attached is a status report on land application of biosolids. This report provides biosolids program information relating to EPA and State staff, State delegation, land application data for seven States, responding to and tracking health complaints, risk assessment and pathogen testing concerns, EPA's relationship with the Water Environment Federation, and public acceptance concerns. The report is based, in part, on work we did in response to an allegation citing numerous problems with the biosolids program.

Because this is a status report that does not contain recommendations, a written response is not required, and this report is considered closed upon issuance in our automated tracking system. If you have questions or comments about the report, please contact me at (202) 260-5471 or Virginia Roll at (202) 260-5101.

We greatly appreciate the cooperation we received from your staffs during our review and the opportunity to attend two excellent conference/workshops co-sponsored by EPA.

Attachment

Executive Summary

Introduction

Sewage sludge is the solid, semi-solid, or liquid by-product generated during the treatment of wastewater at sewage treatment plants. According to the U.S. Environmental Protection Agency (EPA), over half the sludge produced each year is "used beneficially," primarily on agricultural land. The treated sewage sludge used in land application is called "biosolids" by EPA and the industry.

Land application of biosolids is a controversial issue. Concerns have been expressed about potentially adverse impacts of biosolids on human health and the environment as well as quality of life for nearby residents. However, EPA has taken the position that the biosolids program is low-risk and low-priority.

Purpose

In March 2001, the National Whistleblower Center submitted a series of allegations to the EPA Office of the Inspector General (OIG) concerning EPA's conduct in regard to regulating biosolids. The allegations by the Center were based largely on issues raised by an EPA research scientist. In addition, a previous OIG audit on biosolids, issued in March 2000, found inadequacies in EPA's management and enforcement of the biosolids program. For these reasons, we are providing a status report on land application of biosolids. The specific issues we examined, as well as the status of each, are summarized below.

Status of Issues

EPA and State Biosolids Program Staff. Some State officials have expressed concerns that EPA is not dedicating sufficient staffing and financial resources to the program. Nonetheless, EPA continues to place a low priority on the program, and staff assigned to the biosolids program have been declining. For example, at the Regional level, EPA had dedicated 18 full-time equivalent (FTE) positions to biosolids in 1998 but only 10 FTEs in 2000. At the State level, staff assigned to biosolids vary significantly, with nearly half of the States dedicating one or fewer FTEs to biosolids. EPA's position is that the resources allocated to the biosolids program are appropriate when balanced against competing priorities.

Delegation of the Biosolids Program to the States. The Clean Water Act gives EPA authority to delegate the biosolids program to States, but little progress has been made thus far. Only five States have received formal delegation from EPA for the biosolids program. Given EPA's lack of resources devoted to the Federal program, EPA cannot be certain that all citizens in non-delegated States are provided at least the same level of protection as in the Federal program.

Extent to Which Biosolids Are Land Applied in Seven States. There can be a wide variation in how States manage biosolids. For seven States from which we received information, we noted significant differences in their sludge management practices. For example, one State land applied only 10 percent of the biosolids it generated, while another land applied over 80 percent of the biosolids it generated.

Responding to and Tracking Health Complaints. The National Whistleblower Center sent us a list of 21 complaints related to sludge exposure and contended EPA failed to investigate any of the cases. Of the 21 cases, we determined that EPA and/or a State agency investigated 14. For the remaining seven complaints, EPA and State officials indicated five were not reported to them, and the remaining two involved non-sludge composting facilities and thus were not biosolids related. Regarding tracking, EPA had no formal process.

Risk Assessment and Pathogen Testing Concerns. Discussions about whether research is needed to address risk assessment uncertainties and pathogen issues regarding the safety of land application of biosolids have contributed to the controversy regarding biosolids. EPA does not plan to complete a comprehensive evaluation and monitoring study to address risk assessment uncertainties. In addition, there are indications that more research on pathogen testing is needed.

EPA's Relationship with a Professional Association. The National Whistleblower Center expressed concern about EPA's support of the Water Environment Federation, a professional association. However, of the $12.9 million EPA provided over a 3-year period to the Water Environment Federation and a research organization the Federation created, 96 percent of that amount ($12.4 million) had been Congressionally mandated and EPA had no discretion in awarding these funds.

Public Acceptance Concerns. Despite Federal regulatory safeguards, public acceptance of land application of biosolids has been mixed and public scrutiny of the practice continues. There are public concerns regarding the impact of biosolid land application on health, quality of life, and natural resources. These concerns have led a number of counties and municipalities to ban or restrict the land application of biosolids. Public perception regarding biosolids land application can have a significant impact on the implementation of the program.

Agency Comments

Although this status report does not contain any recommendations, EPA's Office of Water provided comments to the draft of our report. Those comments are included as Appendix C. We have incorporated their recommended changes as appropriate.

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Introduction

Production of sewage sludge has increased in this country as a result of more stringent wastewater treatment requirements and a growing population. Sewage sludge is the solid, semi-solid, or liquid by-product generated during the treatment of wastewater at sewage treatment plants. The Environmental Protection Agency (EPA) estimates that more than seven million dry metric tons (DMTs) of sewage sludge are produced annually. According to EPA, over half the sludge produced (54 percent) is "used beneficially," that is, applied on agricultural, horticultural, forest, and reclamation land throughout the country. The treated sewage sludge product used in land application is called "biosolids" by EPA and the industry.

Purpose

In March 2001, the National Whistleblower Center, a non-governmental organization, submitted a series of allegations to the EPA Office of the Inspector General (OIG) concerning EPA's "conduct in regard to regulating the dumping of waste products generated by sewage treatment plants...." The allegations by the Center were based largely on issues raised by an EPA research scientist. Other interested stakeholders have also raised concerns about land application.
In addition, a previous OIG audit on biosolids, issued in March 2000, found inadequacies in EPA's management and enforcement of the biosolids program which, to date, have not been resolved. For these reasons, we are providing a status report on land application of biosolids. This report does not include findings and recommendations and is neither an audit nor an evaluation. It will describe the following issues relating to biosolids:

- EPA and State biosolids program staff.
- Delegation of the biosolids program to the States.
- Extent to which biosolids are land applied in seven States.
- Responding to and tracking health complaints.
- Risk assessment and pathogen testing concerns.
- EPA's relationship with a professional association.
- Public acceptance concerns.

Background

Congress gave EPA broad authority to deal with water pollution when it enacted the Clean Water Act (the Act) in 1972. The Act's goal is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Under this mandate, EPA has developed a variety of regulations and programs to reduce pollutants entering all surface waters, including lakes, rivers, estuaries, oceans, and wetlands. For example, in order to discharge pollutants into the waters of the

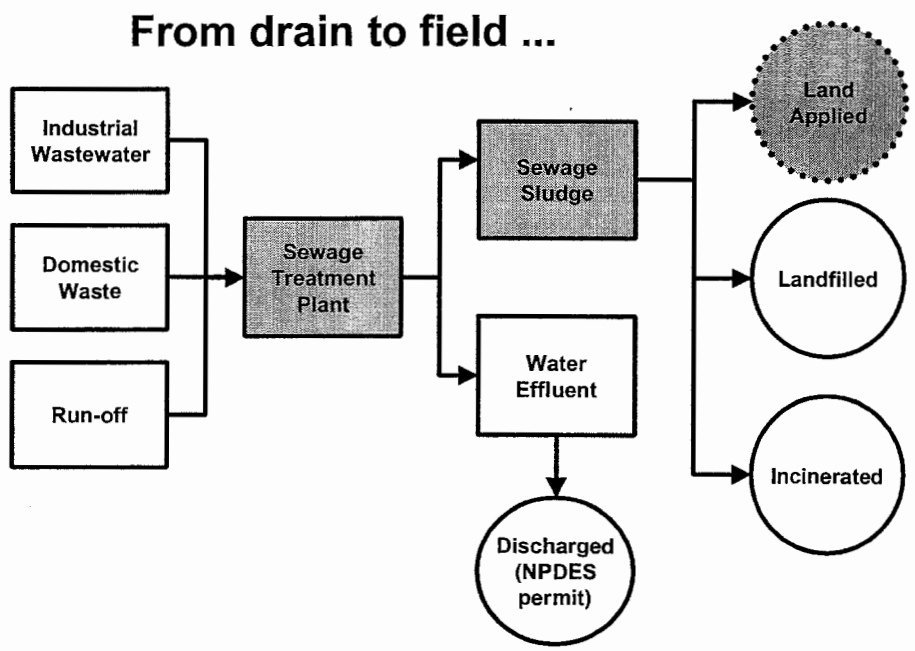
United States, a facility such as a sewage treatment plant must obtain a permit from EPA or a State. The permit, issued under the National Pollutant Discharge Elimination System, establishes the amount of each pollutant a plant may discharge.

The Act's requirements for more effective removal of pollutants from wastewater have resulted in the production of large quantities of sewage sludge. Because sewage sludge may contain toxic pollutants and disease-causing organisms, failure to properly manage sewage sludge may have adverse effects on human health and the environment.

When Congress amended section 405 of the Act in 1987, it required EPA to develop a comprehensive program to reduce environmental risks and maximize the beneficial use of sewage sludge. In February 1993, EPA promulgated Title 40, Code of Federal Regulations, Part 503, "Standards for the Use or Disposal of Sewage Sludge." (This report will refer to these standards as the "Sludge Rule" or "Rule.")

The Rule establishes requirements for use or disposal of sewage sludge in three circumstances: land application, disposal in landfills, and incineration (see Figure 1). Land application of biosolids involves spraying or spreading the material on the surface of the land, injecting it below the surface, or incorporating it into the soil. The Rule's Preamble states that sewage sludge is a "valuable resource" due to its fertilizer and soil conditioner properties. However, due to concerns about the safety of the practice, land application of biosolids can be controversial.

Figure 1



The standards for each use or disposal method consist of general requirements, numerical limits on the pollutant concentrations in sewage sludge, management practices, and operational requirements. The Sludge Rule also includes monitoring, record keeping, and reporting requirements. With regard to land application, the requirements primarily depend on the quality of the biosolids. The characteristics which determine biosolids quality are the level of pollutants (metals) in the biosolids; the presence or absence of pathogens (disease-causing organisms); and the degree of attractiveness to vectors (disease-carrying animals and insects such as rodents, birds, and flies). In addition, the Rule distinguishes between two classes of pathogen reduction in biosolids:

- **Class A:** The Rule requires that pathogens in these biosolids be reduced to below detectable levels. Within Class A, Exceptional Quality (EQ) biosolids meet the Rule's most stringent metals limits. The Rule places no restrictions on the land application of EQ biosolids, but it does place restrictions on Class A biosolids that do not meet the stringent metals limits.

- **Class B:** The Rule requires that pathogens be significantly reduced but not below detectable levels for Class B biosolids and sets site restrictions and farm management practices to be used when applying such biosolids.

A great deal of attention has been focused on land application of biosolids. In March 2000, a Congressional hearing was held on EPA's Sludge Rule. Also, various municipalities and counties have instituted land application bans. For example, several California counties recently banned Class B biosolids land application. Further, national and local media and at least one environmental group have reported on the issue of land application.

Prior Audit Coverage

The General Accounting Office issued a report in March 1990, *Water Pollution: Serious Problems Confront Emerging Municipal Sludge Management Program* (GAO/RCED-90-57). The report was issued before the final Sludge Rule was promulgated. This report identified potential problems for the implementation of a national biosolids program, including the possibility of continued low State participation, the probability of inadequate resources, and the need for development of an effective enforcement program.

An EPA OIG audit report, *Biosolids Management and Enforcement,* issued in March 2000 (No. 2000-P-10), disclosed that EPA does not have an effective program for ensuring compliance with the land application requirements of the Sludge Rule. Some of the points the report noted were:

- In fiscal 1998, EPA reviewed only about 38 percent of the annual reports submitted by sewage treatment plants.

- EPA performed few biosolids-related inspections of sewage treatment plant operations, virtually no inspections of land application sites, and few record inspections of treatment plants or land appliers.

- The biosolids program had been delegated to only three States,[1] and there was virtually no Federal oversight of State biosolids programs in nondelegated States.

The report concluded that the almost complete absence of a Federal presence in the biosolids program was a result of the low priority given to biosolids management by EPA's Office of Water and the decision of EPA's Office of Enforcement and Compliance Assurance not to commit resources to biosolids.

Scope and Methodology

For this review we focused on land application; we did not address landfill disposal and incineration of sludge. Where we discuss State biosolids issues, we did not evaluate the adequacy of State programs. We began our field work in May 2001 and completed it in September 2001.

We spoke to or examined information from various industry representatives, including one of the nation's large land application companies; State officials; private citizens; environmental groups; university scientists; and representatives of EPA and other Federal organizations. We attended the joint EPA/U.S. Department of Agriculture *Workshop on Emerging Infectious Disease Agents and Issues Associated with Animal Manures, Biosolids and Other Similar By-Products*, held June 4-6, 2001, in Cincinnati, Ohio. We also attended the third annual *National Biosolids Conference/Workshop*, held June 25-28, 2001, in Potomac, Maryland. In addition, we toured a local wastewater treatment plant and interviewed officials responsible for plant operations.

We took into account the prior OIG audit on EPA's biosolids program (see "Prior Audit Coverage" section). Further details on our scope and methodology are in the body of the report and Appendix A.

[1]Two additional States have obtained delegation since our prior report. See Table 3.

EPA and State Biosolids Program Staff

Some State officials have expressed concerns that EPA does not consider the biosolids program a priority and is not dedicating sufficient staffing and financial resources to the program. Despite State concerns, EPA continues to place a low priority on the program, and staff assigned to the biosolids program have declined in recent years. In addition, staff assigned to biosolids programs by the States vary significantly, with nearly half of the States dedicating one or fewer full-time equivalent (FTE) positions to biosolids. EPA's position, as expressed in responses to our prior report, is that: (1) EPA's financial resources are limited; (2) the level of resources allocated to the biosolids program is appropriate when balanced against competing priorities; and (3) many States have excellent oversight programs.

EPA Resources

The responsibility for EPA's biosolids program is spread among 4 EPA Headquarters program offices (see Table 1) and the 10 Regional offices. Collectively these program and Regional offices perform activities designed to: (1) maintain strong science and risk assessment; (2) set, enforce, and revise standards; (3) support State and local decision-making; (4) ensure appropriate incident response; and (5) improve the quality and accessibility of information.

Office of Water officials estimated that Headquarters program offices devoted less than six FTEs to managing biosolids in fiscal year 2000:

Table 1:
Biosolids Staff in EPA Headquarters Offices

EPA Office	Biosolids FTEs
Office of Water	4.0
Office of Research and Development	1.6
Office of General Counsel	0.2
Office of Enforcement and Compliance Assurance	0.0
Total	5.8

As can be seen from the table, the Office of Water provides the majority of the Headquarters FTEs managing the biosolids program, while the Office of Enforcement and Compliance Assurance (OECA) provides none, even though it

has program responsibilities. As we explained in our prior report, that office has disinvested from the biosolids program.

EPA Regional Coordinators informed us that among the 10 Regional offices, approximately 10 FTEs were dedicated to managing biosolids in fiscal 2000. However, our prior audit noted that the Regions had dedicated approximately 18 FTEs in fiscal year 1998 to managing biosolids. Thus, in 2 years, there was a significant drop in the Regional staffing levels for this program. (Because the prior report concentrated on the Regions, we were not able to compare the fiscal 2000 levels for Headquarters personnel with fiscal 1998 levels.) Further, our review of EPA Regional FTEs dedicated to enforcement of the Sludge Rule showed that the FTEs declined from slightly more than seven in fiscal year 1998, to slightly less than four in fiscal year 2000. These numbers are shown in Table 2.

Table 2:
Regional Biosolids FTEs

Year	Total FTEs	Enforcement FTEs
1998	18	7
2000	10	4

At the 2001 National Biosolids Conference in Potomac, Maryland, there were presentations and discussions of biosolids-related issues and program concerns. Four EPA Regional staff expressed the following concerns about resource levels for biosolids programs:

- *There are two people for eight States. Reviewing more than 700 annual reports per year is impossible.*
- *Low environmental risk makes it hard to get resources.*
- *100 percent of my time is spent on biosolids, mostly enforcement and compliance assistance. It is not enough. OECA should invest in biosolids.*
- *We used to have three or four people for biosolids enforcement; now we have one.*

State Resources

Because EPA has assigned a low priority to the biosolids program, the burden of ensuring that biosolids are managed effectively falls to the States. In response to our previous report on biosolids, which was critical of EPA for having insufficient resources dedicated to the biosolids program, key EPA officials indicated they believed the States were adequately addressing biosolids program needs. In a February 2000 response to the draft of our prior audit, the then Assistant

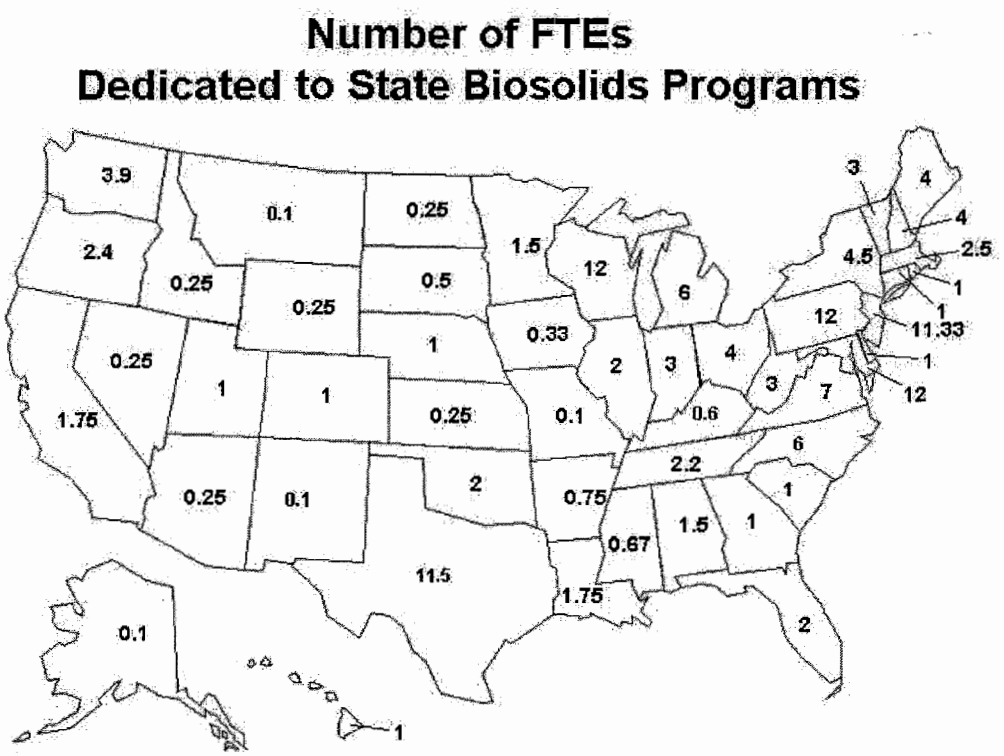
Administrator for the Office of Water stated, "a program for regulation, compliance oversight, and enforcement of biosolids use and disposal exists in every State." Further, in June 2001, the then Acting Assistant Administrator for the Office of Water stated in response to the final version of our prior report that, "Many States have excellent oversight programs."

However, comments from State Biosolids Coordinators at the 2001 National Biosolids Conference indicated that biosolids program staffing levels may not be adequate:

- *How do we run our program with fewer resources and deal with septage, delegation, pollutants of concern, odors, rising energy costs, and composting?*
- *There remains a critical lack of resources at both the State and Federal levels.*
- *We don't have the resources to find out causes of problems.*
- *Is there any way to obtain more resources?*

In addition, data on State staffing provided by State Biosolids Coordinators suggest that many States' biosolids programs may not be adequately staffed. As can be seen from the following map, State staffing varies significantly.

Figure 2



Nationwide, there are 140.33 FTEs assigned to State biosolids programs. While this averages out to almost 3 FTEs per State (2.81), in fact, this is not how biosolids staff are generally distributed. Nearly half of the States (24) have one or fewer FTEs, while 5 States have 42 percent of all of the FTEs. Those 5 -- Texas, Wisconsin, Pennsylvania, Maryland, and New Jersey -- have between 11 and 12 FTEs each, for a total of 58.83.

In our previous report we said that, "EPA cannot assure the public that current land application practices are protective of human health and the environment." Given the almost 50-percent reduction in EPA enforcement resources and the number of States with one or fewer FTEs devoted to biosolids, we believe this conclusion is equally valid today.

Concerns of State Biosolids Coordinators

Several State officials stated that EPA is not sufficiently committed to the biosolids program. At the 2001 National Biosolids Conference, various State Coordinators expressed their concerns.

- *EPA needs a true goal with staffing and financial directives.*
- *EPA resources are going into TMDLs[2] -- not to biosolids.*

A third State official noted that it took a cryptosporidium outbreak to get dollars shifted to drinking water research. Related to this issue, another State official opined that a similar outbreak involving land-applied biosolids would probably result in the abolishing of land application rather than research; however, this official believed that the States would probably get out of land application before such a crisis actually occurred.

Further, State Biosolids Coordinators have expressed concerns regarding EPA's shift from advocacy of land application to a neutral position, without any written explanation. According to Office of Water senior managers, EPA used to be proactive in promoting biosolids land application because it is consistent with recycling. However, a recent Assistant Administrator decided the Agency should instead be method-neutral; i.e., regulators should not be promoters of any one of the management methods over another described in the Sludge Rule. While some Office of Water senior managers said they did not see the shift as a major change, some State coordinators believed otherwise.

In addition, on various occasions dating back to 1998, the Wisconsin State Biosolids Coordinator, who said he had broad State consensus, expressed concerns directly to senior EPA officials. In an October 1998 letter, the

[2] The TMDL (Total Maximum Daily Load) Program involves calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards under the Clean Water Act.

representative urged EPA to financially support biosolids research and development, as well as the Pathogen Equivalency Committee.[3] The representative also requested that EPA have a dedicated Biosolids Coordinator in every Region to maintain oversight of the entire program.

Almost 3 years later, in September 2001, the Wisconsin State Biosolids Coordinator wrote to the EPA Administrator about biosolids management. He requested that, "the biosolids program within EPA be granted additional funding and personnel to effectively implement this overburdened program." As support for this request he pointed out:

> *Only about $4 million (of EPA's FY 2001 budget) ... was devoted to biosolids staff and the program .... At the same time approximately 40% of the cost of wastewater treatment is expended on sludge treatment and management. This inequity has far-reaching consequences and places beneficial use in severe jeopardy.*

His letter cited a series of events he believed should force the Agency to reconsider the low priority rating given to biosolids and reallocate resources and staff to the program. His letter concluded with recommendations for immediate action, including: increasing staffing levels within EPA for the biosolids program; funding the Pathogen Equivalency Committee; and making funds available to States for elevating their biosolids programs.

The Wisconsin State Biosolids Coordinator presented the Opening Comments at the 2001 National Biosolids Conference, and continued to express concern about EPA's biosolids program:

> *As you may recall at last [year's meeting], a warning cry was raised that the viability of land application of biosolids would be in jeopardy if more resources and oversight were not directed to the program.... A year later, regulatory oversight and program implementation remain critical issues and the long-term viability of beneficial reuse remains hanging in the balance.... There remains a critical lack of resources at both the state and federal level and dwindling staff at the federal level. The biosolids program continues to receive a very low priority rating within EPA.*

[3] The Committee is comprised of EPA experts who review pathogen and vector attraction reduction processes and provide guidance and recommendations to the regulated community and permitting authority on whether the proposed processes are equivalent to processes in the Rule.

EPA Position on Resources

EPA Headquarters officials attending the conference acknowledged that resource needs expressed by EPA Region and State personnel would not be met. The Director of the EPA Office of Wastewater Management noted that the biosolids program is competing for funding with many other water and wastewater infrastructure demands, and he does not expect additional funding to be available for biosolids efforts.

This was confirmed in a January 2002 response to our prior audit. The response, from the Assistant Administrator for Water and the Acting Assistant Administrator for Enforcement and Compliance Assurance, stated:

> *Implementation of most, if not all, of the recommendations ... would require additional resources in terms of people and dollars which are simply not available. We have only finite resources to support a large number of responsibilities to address risks to the nation's water resources ... we believe the level of resources currently allocated to the biosolids program is appropriate when balanced against competing priorities.*

Delegation of the Biosolids Program to the States

Section 405 of the Clean Water Act gives EPA the authority to delegate the biosolids program to the States, but little progress has been made thus far. Because only five States have received formal delegation from EPA for the biosolids program, and EPA devotes few resources to the program, there has been minimal implementation of the Federal biosolids program.

EPA has had more success in delegating other environmental programs. For example, EPA has delegated primary responsibility for the Underground Injection Control program to 34 States, and shares program responsibilities with 6 other States. Primary responsibility for the hazardous waste base program under the Resource Conservation and Recovery Act has been delegated to 48 States, the District of Columbia, and Guam.

Before a State can apply for delegation of the biosolids program, it must have laws and regulations equivalent to the Federal requirements. These State laws and regulations must include authority to: regulate all sewage sludge management activities subject to the Sludge Rule, unless the State is applying for partial delegation; issue permits; regulate use or disposal of sewage sludge by non-permittees; require and ensure compliance; abate violations; and take actions to protect public health and the environment.

Obtaining biosolids program delegation can be a lengthy process. The five States that obtained delegation, as well as the time frames, follow:

Table 3:
Approval Time Frames for Delegated States

State	Application Date	Approval Date	Days To Process
Oklahoma	6/10/96	11/19/96	162
South Dakota	8/12/98	10/22/01	1167
Texas	2/5/98	9/14/98	221
Utah	10/10/95	6/14/96	248
Wisconsin	3/8/99	7/28/00	508

According to Office of Water officials, as many as 17 States may be seeking delegation of the biosolids program. A reason given by State officials for seeking delegation is that membrs of the regulated community prefer to interact with the State rather than EPA.

The remaining States are not currently seeking biosolids program delegation, and some have indicated they do not plan to do so. Some State and Regional Biosolids Coordinators noted that their States had not applied because the application process was costly; EPA was not providing funds to States to implement the Federal program; and they thought they had sufficient authority under their own statutes to carry out the program. As one official from New Jersey stated, "the resources required to put together a delegation package, and the resources required to report information to USEPA once delegation is obtained, may exceed any perceived benefit in receiving delegation." Also, an official from Oregon estimated that, since 1989, his State has spent more than $100,000 on delegation issues, which shifted resources away from biosolids program management for long periods of time.

On October 3, 2001, the OIG received a written statement, from one of the nation's large land application companies, on many of the biosolids issues under review. About delegation the land applier stated:

> *We support the proposition that more states should seek delegated authority. In this vein, we suggest that EPA should promote, at the very least, more partial delegations because many states meet or exceed parts of the [Sludge Rule].*

EPA's Office of Water does not see delegating the program to the States as a high priority. The Assistant Administrator for Water, in responding to the draft of our March 2000 audit report, stated that the Office of Water:

> *. . . does not expect to devote significant effort to encouraging the Regions to delegate the biosolids program to the States. At the present time, there is little incentive for the States to seek delegation, and some States see impediments to delegation, e.g., the effect of State self-audit statutes, and issues related to the Endangered Species Act and the National Environmental Policy Act.*

The Federal biosolids program is being implemented in five States. Although State biosolids programs may be implemented in the remaining States, they may not mirror the Federal program. Given EPA's lack of resources devoted to the Federal program and the small number of delegated States, EPA cannot be certain that all citizens in non-delegated States are provided at least the same level of protection as in the Federal program.

Extent to Which Biosolids Are Land Applied in Seven States

There can be a wide variation in how biosolids are managed in different States. We were able to obtain, from seven States, information on the quantities of biosolids generated, land applied, and exported. These seven are not meant to be a representative sample of all States, but the information they provided illustrates some of the differences in management. For example, New York land applied only 10 percent of the biosolids it generated and exported almost half. In contrast, Colorado land applied over 80 percent of the biosolids it generated and exported none. In Virginia, 45 percent of the biosolids land applied were imported from other States. In New Jersey, only 3 percent of biosolids land applied were imported, and two other States did not land apply any imported biosolids. The data are presented in Table 4 and in greater detail in Appendix B, which also contains maps of the seven States showing counties where biosolids are land applied.

Table 4:
Class B Biosolids Land Application Data for Seven States

State	Biosolids Generated (DMT/yr) [4]	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
Colorado	59,842	49,358	14,371	0
Florida	244,890	161,627	0	0
Maryland	131,998	79,971	14,946	37,635
New Jersey	320,000	183,178	5,794	85,409
New York	327,300	33,900	14,812	157,300
Virginia	225,000	95,868	78,437	< 1,000
Wisconsin	159,750	84,725	0	0

[4] Not all generated biosolids are land applied. Some are incinerated or placed in a landfill. Therefore, the Land Application of In-State Generated Biosolids column numbers added to the Exported Biosolids column numbers do not equal the Biosolids Generated column numbers.

Responding to and Tracking Health Complaints

The National Whistleblower Center sent us a list of 21 complaints alleging well contamination, illness, or death in which exposure to sludge was identified as a possible cause. The Center contended that EPA failed to investigate any of these cases. In this section, we will examine EPA's response to the 21 alleged complaints and the extent to which EPA had a standardized process to investigate and retain data on complaints regarding exposure to sludge.

Responding to Alleged Complaints

We obtained information on investigations of the 21 cases through electronic correspondence and interviews with EPA Regional and State Biosolids Coordinators; EPA Headquarters staff in the Office of Water; and, in a few cases, local officials and members of the public. We are defining investigation to mean a response by EPA or a State agency to a reported complaint. Because our focus was on whether EPA responded to the complaint, we did not attempt to conduct site visits or interview complainants.

Of the 21 cases, 14 were investigated by EPA and/or a State agency. According to EPA and State officials, five of the remaining seven alleged health complaints were not reported to them. The two remaining cases were not biosolids related because they involved non-sludge composting facilities. A breakdown is in Table 5.

Table 5:
Information on 21 Cases

Response	Number of Incidents
Investigated by EPA	2
Investigated by EPA and a State Agency	5
Investigated by EPA and a County Agency	1
Investigated by a State Agency	6
Not Investigated (EPA or State Biosolids Program Officials stated these cases were not reported to them.)	5
Allegation involved non-sludge composting facilities	2
Total	21

Although EPA has sometimes addressed health effects in response to biosolids complaints, EPA responses tend to involve compliance issues. EPA officials said investigating health impacts from biosolids is not an EPA responsibility; rather, they believe it is the responsibility of the National Institute of Occupational Safety and Health, the Centers for Disease Control, and local health departments. Furthermore, EPA does not have a formal process to track health-related complaints as we discuss below. In general, we did not obtain information on the types of investigations conducted by State agencies. However, at least some of the State investigations, and the one done by the county, involved health issues.

Tracking Process

In addition to looking at the National Whistleblower Center's 21 cases, we also discussed EPA's process for tracking health-related complaints about biosolids. EPA officials told us that there is no central EPA system for these complaints. If a request comes into Headquarters for information about a particular complaint, Office of Water staff contact Regional Biosolids Coordinators to gather details about a specific incident. The Pathogen Equivalency Committee also receives complaints about health issues related to land application. These are reviewed by the physician member of the Committee.

In contrast to EPA, Maryland has implemented a more centralized, automated approach. According to a State official, Maryland has a single database to handle complaints for all program areas, not only biosolids, and has also developed an electronic form for recording and investigating biosolids odor complaints. Maryland has devoted more staff to running its biosolids program (12) than all but one other State. Maryland's 12 FTEs in 2000 were more than that of all 10 EPA Regional offices combined.

Further, the letter from the land application company noted:

> *...better tracking of odor and any health complaints is essential for improving land application of biosolids and its public acceptance.... [O]ne resolution is to initiate a regulatory requirement for a comprehensive cradle-to-grave tracking system. This could be accomplished without high cost by using modern computerized tracking tools. It could also be managed at the state and local level, where it could be integrated with local and state public health agencies, as appropriate.*

While a tracking system similar to the one suggested by the land applier could be a tremendous help to Regional and State enforcement personnel, Regions and some States may not have sufficient enforcement personnel to make use of such a system.

Risk Assessment and Pathogen Testing Concerns

Uncertainties in the risk assessment for the Sludge Rule and questions about pathogens in biosolids have contributed to the controversy regarding the safety of the land application of biosolids.[5] Whether research is needed to address risk assessment uncertainties and pathogen issues has been a topic of discussion since the Rule's promulgation. The National Whistleblower Center, in its letter to the OIG, expressed concerns about the adequacy of the risk assessment supporting the Rule, and risks from pathogens in Class B biosolids.

The Preamble to the Sludge Rule states that the Rule's standards are adequately protective and describes approaches taken by EPA to address risk assessment uncertainties. These approaches included conservative assumptions and a commitment to further research. In addition, EPA chose operational standards to manage the risks from pathogens (disease-causing organisms) and vectors (disease-carrying insects or animals) in sludge, because, due to insufficient data, a risk assessment was not conducted on pathogens. Under these standards, biosolids must meet technology-based requirements for minimizing or eliminating pathogens and reducing vector attraction. For pathogens, these requirements can be met by reducing the pathogens in biosolids to below detectable levels (Class A) or to levels that are reduced but still detectable and are coupled with certain restrictions (Class B).

In addition to the Preamble to the Sludge Rule, information for this section's presentation of risk assessment and pathogen issues was obtained from a 1996 study by the National Research Council (*Use of Reclaimed Water and Sludge in Food Crop Production*), and discussions and papers presented at the June 2001 Cincinnati workshop on emerging infectious disease agents in animal manures and biosolids. We also obtained EPA guidance and memos on sewage sludge and the Sludge Rule, and interviewed officials in EPA's Office of Water and Office of Research and Development.

Risk Assessment Supporting the Sludge Rule

As described in the Sludge Rule Preamble, EPA conducted an extensive risk assessment on the potential for adverse effects on public health and the environment from pollutants in sludge. However, the Preamble also describes uncertainties in some important aspects of the risk assessment related to human

[5] Scientific uncertainty is an expected factor in environmental risk assessments. These uncertainties may include the usual variance that exists in scientific measurements and data gaps.

health, human exposure pathways, plant toxicity and uptake, effects on wildlife, and ground water impacts. Due to these uncertainties, EPA made many conservative assumptions as well as some less conservative assumptions for the Sludge Rule. For example, there was a conservative assumption that humans may be more sensitive to a pollutant than animals tested when, in fact, this may not be the case. Another conservative assumption was that a human may be exposed to a pollutant in biosolids for a lifetime whereas the period of exposure may, in fact, be much shorter. Other conservative assumptions related to plant uptake of metals, application rates, soil ingestion, concentrations of pollutants in sludge, ground water contamination, and inhaling organic pollutants.

In general, EPA may adopt a less conservative assumption when the conservative assumption is judged to be unrealistic. For illustration purposes, we selected two of the less conservative assumptions adopted by EPA, to discuss in this section. These assumptions involved the long-term behavior of pollutants (metals) in sludge and plant uptake of metals. The assumption about long-term behavior of metals in sludge was based on the theory that metals bind to sludge, which makes them less available for uptake by plants. The Preamble states that there was limited documentation to support conclusions about the long-term behavior of metals in sludge, e.g., that metals will continue to bind to the sludge over a long period of time.

Regarding plant uptake of metals, the Preamble states that there is uncertainty in the estimates of plant uptake of metals. The calculation method used in plant studies for the Sludge Rule, to estimate how much metal was taken up by plants from sludge, may have resulted in less conservative (lower) estimates of plant uptake of metals than another method would have produced.[6] However, according to the Preamble, there was a compensating factor: the studies used sludge with higher metals concentrations than sludge typically land-applied today. The Preamble suggests that the use of sludge with higher metals content in these studies may have compensated for the less conservative estimates of plant uptake.

Information obtained since the Rule's promulgation supports the Preamble's claim that metals concentrations in biosolids are currently lower than in the past. According to an EPA official, a preliminary analysis of biosolids monitoring data suggests that about 85 percent of land-applied biosolids in the United States now meets the same low metal standards[7] required for EQ biosolids. As explained earlier in this report, EQ biosolids meet the Rule's most stringent standards for pathogens and metals. These preliminary indications of low metals in biosolids are encouraging, but also mean that research results for the Sludge Rule with

[6] The less conservative geometric mean was calculated for these plant uptake studies rather than the more conservative arithmetic mean.

[7] Pollutant (metals) concentrations in Table 3 of section 503.13 of the Sludge Rule.

respect to metals are out of date. A study to verify that 85 percent of land-applied biosolids meets low metals standards might help to alleviate some of the concerns about the long-term behavior of metals in biosolids.

Uncertainties in the risk assessment were discussed by EPA offices during their reviews of the final Rule prior to publication, and scientific debate within EPA on these issues delayed progress on the final Rule. Because there were issues EPA could not resolve before a court-ordered deadline for the Rule's publication, a commitment was made to perform further research (a comprehensive evaluation and monitoring study).

EPA acknowledged this commitment in the Preamble and also acknowledged that, depending on research results, revisions to the risk assessment decisions for the Rule may be necessary. However, due to competing priorities and EPA's determination that biosolids were low risk, only one major study, known as the Oak Ridge Study, was initiated as a result of the commitment. The final draft of the Oak Ridge Study report[8] was not peer reviewed and is not officially endorsed by EPA although it was released to the public at the request of a U.S. Senator. An EPA official said that more work was needed on the study, but the additional work was not funded. As a consequence, the questions on ecological risks from sewage sludge that prompted the study were not satisfactorily answered.

Other studies have been conducted on sewage sludge issues since promulgation of the Rule, but these studies were conducted for purposes other than to address the comprehensive study commitment in the Preamble. Further, there has been no formal process to compare results from these other studies to the Sludge Rule's risk assessment uncertainties. There are no plans to complete the comprehensive study, and uncertainties remain unaddressed by further research.

Concerns About Pathogen Testing

In spite of the lack of a risk assessment on pathogens for the Sludge Rule, the only research on pathogens committed to in the Preamble concerned the ecological effects from pathogens. However, there are indications that more research is needed on risks to human health from pathogens in sludge. When the Sludge Rule was promulgated in 1993, due to safety and liability questions, the food processing industry was reluctant to accept the practice of using treated wastewater and sludge in producing food for human consumption. Therefore, EPA asked the National Research Council of the National Academy of Sciences to conduct a study that resulted in the 1996 report, *Use of Reclaimed Water and*

[8] *Evaluation of the Ecological Risks Associated with Land Application of Municipal Sewage Sludge,* September 30, 1998. Funded by EPA under an Interagency Agreement to Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Sludge in Food Crop Production. Although the Council concluded that the "use of wastewater and sludge in the production of crops for human consumption presents a manageable risk," concerns about pathogens in sludge were discussed in their report. Some of the same concerns were discussed by research scientists during the 2001 Cincinnati Conference. This conference, jointly sponsored by EPA and the U.S. Department of Agriculture, was attended by an international group of research scientists.

Although the Council found in its 1996 study that Class A sludge standards appear to be adequate for public health protection, it stated that "the method used to determine if the [pathogen] standard has been met can be questionable." The Council's report identified a problem regarding the test for the detection of salmonella (a pathogen). The report recommended the salmonella test not be used in evaluating sludge as Class A unless it is used along with the fecal coliform test. Currently the Rule allows either a fecal coliform or salmonella test to be used to show that Class A microbiological requirements are met. Scientists at the 2001 Cincinnati workshop on pathogens were also concerned about the salmonella test.

In addition, the Council report recommended that EPA reevaluate the 30-day waiting period for grazing animals after Class B sludge is applied to fields. This recommendation was due to a finding in Denmark that tapeworms may survive in sludge-treated fields for up to one year. This was another area of concern for scientists at the Cincinnati workshop.

The Council report also recommended that, "EPA should continue to develop and evaluate effective ways to monitor for specific pathogens in sludge." The Council explained that the presence of coliform bacteria, an indicator organism, may not accurately predict the presence of other organisms that may be pathogens. Again, this area of concern was discussed during the Cincinnati workshop.

EPA has asked the National Research Council to conduct a second study on EPA's Sludge Rule. The second study is to review EPA's risk assessment methods, data, and standards for eliminating pathogens in sludge. The Council will also determine whether the recommendations in its 1996 report were adequately addressed. The study is expected to be completed in June 2002. If that study does not also address the research commitment in the Preamble, questions will remain about uncertainties in the risk assessment for the Rule:

- How much of the research conducted since 1993 has sufficiently addressed the original commitment to research in the Sludge Rule Preamble?
- Should additional research be conducted to satisfy the commitment?
- Should there be revisions to the Rule based on subsequent research results?

EPA's Relationship with a Professional Association

The National Whistleblower Center letter stated that EPA's support of the Water Environment Federation "creates an appearance of impropriety." For several years, EPA has made large dollar awards of assistance to two non-profit organizations, the Water Environment Federation (WEF), a professional association, and the Water Environment Research Foundation (WERF). The latter is a research organization that WEF established. During the 3 years ending September 30, 2001, EPA awarded $3.2 million to WEF and $9.7 million to WERF, for a total of $12.9 million. However, 96 percent of the financial support that EPA gave to WEF and WERF was Congressionally mandated ($2.8 million of the $3.2 million awarded to WEF, and $9.6 million of the $9.7 million awarded to WERF). Therefore, EPA had no discretion in awarding these funds.

We reviewed automated information pertaining to assistance agreements awarded to WEF and WERF in EPA's Envirofacts Warehouse and Financial Data Warehouse for the 3-year period. We also reviewed the pertinent assistance agreements, amendments, and decision memoranda. We obtained information from the project officers for the Congressionally-mandated awards. Information on WERF's quality management procedures for research projects funded by EPA was obtained from interviews and a questionnaire sent to EPA employees serving on WERF research project subcommittees. We did not perform a financial audit of any of these awards, nor did we look at allowability of costs for any expenditures associated with these awards.

EPA Funds Awarded to WEF

WEF's stated vision is "preservation and enhancement of the global water environment." WEF's membership includes many professionals in the water and wastewater industries, as well as EPA employees.

Most of the funds EPA awarded to WEF in recent years have been Congressionally mandated for implementation of the National Biosolids Partnership. The Partnership was formed in 1997 "to promote environmentally sound and accepted biosolids management practices." In addition to WEF and EPA, the Association of Metropolitan Sewerage Agencies, a national trade association, is also a partner. WEF is the managing partner for the Partnership. During fiscal years 1999 through 2001, $2,752,800 of the $3,247,800 that EPA awarded to WEF was Congressionally mandated. Further, of the remaining $495,000 in discretionary funds that EPA awarded to WEF, assistance award documents show that $190,000 was awarded competitively.

The Congressionally-mandated funds to WEF are being used for an Environmental Management System (EMS) project. According to the National Biosolids Partnership's web site, EMS is being developed to "help organizations that manage biosolids activities assure compliance with applicable Federal, State, and local regulatory requirements and address other environmental issues such as odors that could cause community concerns." Facilities participating in the EMS program must communicate actively with the public and publicize results of EMS audits. According to EPA officials, 27 facilities participated in the initial EMS pilot demonstration, 13 are in the process of being added, and the Partnership hopes to add 60 more facilities by the end of 2003.

EPA Funds Awarded to WERF

WERF's stated mission is to provide a "balanced water quality research program addressing current wastewater research needs and forecasting future directions." For fiscal years 1999 through 2001, $9.6 million of the $9.7 million that EPA awarded to WERF was Congressionally mandated. With funds provided by EPA, WERF subcontracts to other organizations to perform the research. Some of the recent biosolids-related research projects included: *Assessing Bioavailability of Metals in Biosolid-Amended Soils: Root Exudates and their Effects on Solubility of Metals, Nitrogen Management Protocols for Biosolids Beneficial Use,* and *Pathogen Destruction Efficiency in High Temperature Digestion.*

According to the 1999 Annual Report that WERF provided to EPA, 58 EPA employees were participating on 100 project subcommittees at the end of 1999; however, not all of these projects were funded by EPA. For each research project, a project subcommittee is formed of five to six outside experts – including representatives from universities, municipalities, industry, and sometimes EPA. At least one member from EPA must be on the committee when EPA funds are used for the project. We surveyed or interviewed 19 EPA employees, serving on a total of 25 project subcommittees. The results of the interviews and survey did not indicate a lack of quality management procedures in WERF research projects; however, our survey instrument did not allow us to reach definitive conclusions about quality management procedures in WERF projects.

Public Acceptance Concerns

Despite Federal regulatory safeguards, public acceptance of land application of biosolids has been mixed, and public scrutiny of the practice continues. There are public concerns regarding the impact of biosolid land application on health, quality of life, and protection of natural resources. These concerns have led a number of counties and municipalities to ban or restrict the land application of biosolids. Public perception regarding biosolids land application can have a significant impact on the implementation of the program.

Public Concerns About Land Application

Public perceptions can be critical in influencing the choice of options used to manage biosolids. As EPA noted in a September 1999 report:

> *The public's perceptions of biosolids treatment and application can affect whether a facility is built, where it is sited, and how it is operated. Although public perception is often not based on science and can be irrespective of the degree of risk to human health or the environment, it can present a significant deterrent to increased beneficial use. Understanding what the public concerns are can allow biosolids managers to address these concerns as part of their biosolids management program.*[9]

Due to public concerns about possible consequences, such as odors, health effects, and environmental impacts from biosolids, there has been opposition to land application in some locations. Several municipalities and counties in the United States have enacted bans and restrictive ordinances against the land application of biosolids. In California, nine counties issued bans or restrictive ordinances. In Florida, two counties placed restrictions on the use of Class B biosolids. In addition, 67 municipalities in Maine, Massachusetts, New Hampshire, and Pennsylvania have instituted bans or restrictive ordinances on biosolids land application. Several counties in Virginia also passed restrictive ordinances, although the State Supreme Court later ruled against such restrictions.

Health Concerns

Public resistance stems in part from concerns about potential health impacts. Although the Sludge Rule includes a treatment requirement to reduce pathogens to low levels, pathogens may still be present in Class B biosolids. Even with site

[9] *Biosolids Generation, Use, and Disposal in The United States.* EPA-530-R-99-009, September 1999.

restrictions designed to minimize the potential for human contact, concerns have been raised in some magazine and newspaper articles and by some members of the public about the possible health effects from contact with biosolids, including inhaling biosolids dust. The National Whistleblower Center alleged that complainants have experienced adverse health effects such as nausea, burning eyes, dizzy spells, respiratory symptoms, and even death resulting from biosolids.

EPA's position, explained in a 1995 guide to the Sludge Rule risk assessment, is that pathogen levels for Class B biosolids, when coupled with crop harvesting and site access restrictions, have been demonstrated to be sufficient to protect public health and the environment.[10] While we did not attempt to evaluate this position, we noted in our prior audit report of March 2000 that EPA does not have an effective program for ensuring compliance with land application requirements, e.g., crop harvesting and site access restrictions.

Class A vs. Class B Biosolids

Questions about compliance with Class B requirements suggest that Class A biosolids would be preferable in terms of safety and public confidence. To increase the public's acceptance of biosolids land application, some sewage treatment plants are changing their processes to be able to produce Class A instead of Class B biosolids. For example, as part of a $300 million upgrade, the sewage treatment plant in Alexandria, Virginia, is spending approximately $45 million to install equipment to produce Class A rather than Class B biosolids. However, plant officials explained that their decision to upgrade treatment would not necessarily be the right one for every plant. Because the Alexandria plant is in a heavily populated community where there are no land application sites, it has to compete for land application sites in other locations. Other plants may be located where land application sites are more available. Further, Alexandria officials told us that the expense of converting to produce Class A biosolids may mean that some small municipalities will not be able to afford to convert to Class A.

There is another concern related to Class A biosolids. Sewage treatment plants are allowed six alternatives for meeting Class A pathogen requirements (i.e., reduction of pathogens to below detectable levels). Of the six alternatives, two of those (Alternatives 3 and 4) have been criticized by some EPA and State officials, as well as by a land applier, for not being sufficiently protective. When Class A Alternatives 1, 2, or 5 are used for meeting pathogen requirements, treatment methods are described and required by the Rule. When Alternative 6 is used, the treatment method must be approved by the permitting authority. However, for Alternatives 3 and 4 a treatment method is not specified. A facility can designate its biosolids as Class A based on the absence of fecal coliform or salmonella and

[10] *A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule,* EPA 832-B-93-005, September 1995.

the absence of enteric viruses and viable helminth ova. These two alternatives have been criticized because the absence of enteric viruses and helminth ova may not indicate the absence of other disease-causing organisms in the biosolids.

Once biosolids leave the control of the preparer, there are no regulations over land application of EQ biosolids, and there are reduced requirements for land application of Class A biosolids not designated EQ. Therefore, good controls are necessary to ensure that production of such biosolids meets pathogen requirements. It has been recommended by some Federal and State officials and by at least one member of the land application industry that the Sludge Rule be changed to either eliminate or modify Alternatives 3 and 4.

As stated in the 1996 National Research Council report, "General acceptance of sludge application for food crop production probably hinges most on the development of successfully implemented projects that meet State and Federal regulations and address local public concerns." This means that adequate oversight and enforcement of Class A and Class B standards are necessary for public confidence in land application.

Quality of Life Concerns

Quality of life concerns arise as a result of odors around land application sites. When two Florida counties stopped allowing land application of Class B biosolids, the counties cited odors as one of the reasons. EPA noted in a July 2000 biosolids guide that, "Malodors are the single most important cause of public dissatisfaction with biosolids...." Further, EPA stated in the September 1999 report (see footnote 12), that:

> *Not only do the odors themselves cause a public concern, but odors also trigger fears that "foul-smelling" residues from municipalities and industry must be toxic and harmful. In some parts of the country, where rapid suburbanization of former farmland has occurred, biosolids application might no longer be used on the remaining farmland because proximity to residential areas makes actual or potential odor concerns unacceptable to the new neighbors.*

In the same document, EPA further stated that, "treatment and good management practices can control most odor problems keeping them to a minimum." EPA and the U.S. Department of Agriculture are jointly conducting odor-related research. The project is titled, *Interagency Research on the Physiological Effects of Volatile Emissions from Land Applied Biosolids and Animal Manures.*

Truck traffic around land application sites is also a quality of life concern. According to the EPA Region 9 Biosolids Coordinator, heavy truck traffic caused

concerns in two California counties and was a factor in both counties' decisions to limit land application. Biosolids are typically delivered to application sites in tractor trailers or tanker trucks. Application rates generally equate to about one tractor trailer truckload per acre. Therefore, a 50-acre field could receive about 50 truckloads of biosolids. In Virginia alone, biosolids were land applied on more than 39,000 acres in the year 2000. This suggests that as many as 39,000 truckloads of biosolids were on the road in Virginia that year.

Concerns About Protection of Natural Resources

Others have expressed concerns about the impact of biosolids on natural resources. Members of some communities worried that the run-off from biosolids could contaminate ground water and surface water. Four counties in California and two in Florida have restricted land application of biosolids due, in part, to concerns about contamination of the water supply. Biosolids contain significant amounts of nitrogen and phosphorus. Run-off of these nutrients into surface water may impair its use for fisheries, recreation, industry, and as a drinking water source. Nitrate leaching from biosolids into groundwater can impact local wells or eventually discharge to surface waters.

Public Perceptions and the Future of Land Application

Public perceptions may not always be accurate, but they should not be ignored. At the 2001 National Biosolids Conference, State Biosolids Coordinators discussed the importance of public perception and public acceptance and made the following points:

- *The news has little information about biosolids, and the public needs facts.*
- *Pathogens, which have been linked to recent publicized deaths, are a concern.*
- *Odors are also an issue, plus odors trigger concerns about pathogens.*
- *Lack of public acceptance makes the program vulnerable to collapse.*
- *We are losing the public acceptance battle.*
- *How can we alleviate public concerns?*

The importance of public perception is acknowledged by EPA in the September 1999 report.

> *Overcoming public resistance to the beneficial use of biosolids involves a combination of sensitivity to public perception issues, a framework within which the concerns can be addressed, and a willingness to address these issues through management practices and technologies, effective outreach programs, and active marketing of biosolids products.*

At the same time that EPA's resources for the biosolids program are decreasing, some members of the public and the media continue to question the safety of biosolids land application. However, EPA's determination that the program is low-risk and low-priority translates into few EPA funds available to address public concerns. In addition, the Agency does not have a centralized system to keep track of the complaints of adverse health effects that are reported. Not addressing public concerns about safety, gaps in the science, fear of long-term impacts, or any other real or perceived concern may result in severely limiting or halting the practice of biosolids land application.

Scope and Methodology Details

In February 2001, staff from the EPA OIG met with officials from the National Whistleblower Center and an EPA research scientist. The purpose of the meeting was to discuss a series of allegations made by the Center relating to EPA's development and implementation of the Sludge Rule. At the request of the OIG, the Center prepared and, in March 2001, submitted a written summary of the concerns that were raised by them and the EPA research scientist. The March correspondence requested that we conduct an inquiry about the Center's concerns. We began our field work in May 2001 and completed field work in September 2001.

During May and June OIG staff gathered information about three areas of concern in the Center's summary: science supporting the safety of biosolids land application, relative to the risk assessment conducted for the Sludge Rule and pathogen testing; EPA's process for tracking and investigating complaints of adverse health effects due to biosolids land application; and EPA's relationship with the Water Environment Federation.

During our fieldwork on these three areas we learned of concerns from other stakeholders. In addition, the inadequacies we found in our March 2000 audit to date had not been resolved. Therefore, we expanded our scope to include these issues: EPA and State biosolids program staff, delegation of the biosolids program to the States, the extent to which biosolids are land applied in seven States, and public acceptance concerns. We discuss the seven issues in this status report, without developing findings and recommendations. This review was considered a special project and, as such, was not conducted in accordance with all of the generally accepted government auditing standards.

Our fieldwork included interviews with EPA officials and research scientists in the Offices of Water, Research and Development, and Administration and Resources Management. We also reviewed EPA regulations, policy, guidance and memoranda on biosolids and the risk assessment conducted for the Sludge Rule. In order to ensure the accuracy of the facts we present in our report, we solicited comments on our draft report from program officials and scientists in EPA who had provided us with information.

To obtain an understanding of State program issues, we attended the third annual *National Biosolids Conference/Workshop*, held June 25-28, 2001, in Potomac, Maryland. The 2001 conference was jointly sponsored by EPA and the Wisconsin Department of Natural Resources. Attendees were primarily State and Regional Biosolids Coordinators, and technical and scientific staff from EPA's Office of Water and Office of Research and Development. At the conference, we heard presentations by State and Federal officials, participated in general discussion sessions, and had the opportunity to meet individually with State Biosolids Program Coordinators. Seven

of the State Biosolids Coordinators later provided us with the land application data, which we have presented in Appendix B.

Information on EPA's response to 21 alleged health complaints and the extent of EPA's tracking system for biosolids-related complaints was obtained through electronic correspondence and/or interviews with EPA Regional and State Biosolids Program Coordinators; EPA Headquarters staff in the Office of Water; and, in a few cases, local officials and members of the public. Because our focus was on EPA's involvement, we did not attempt to make site visits or interview complainants.

Information on EPA's risk assessment for the Sludge Rule and pathogen issues was obtained from the Preamble to the 1993 Sludge Rule; a 1996 study by the National Research Council, *Use of Reclaimed Water and Sludge in Food Crop Production*; and discussions and papers presented at the *Workshop on Emerging Infectious Disease Agents and Issues Associated with Animal Manures, Biosolids and Other Similar By-Products*, held on June 4-6, 2001, in Cincinnati, Ohio. This workshop was jointly sponsored by EPA and the U.S. Department of Agriculture. In addition, we obtained information from EPA guidance and memos on sewage sludge and the Sludge Rule, and interviewed officials in EPA's Office of Water and Office of Research and Development. We also attended the March 2001 initial meeting of the National Research Council's Committee on Risks from Toxicants and Pathogens in Biosolid Fertilizers. This Committee is conducting the Council's second study on EPA's Sludge Rule.

For our review of EPA's relationship with WEF, we reviewed information pertaining to EPA grants to WEF and WERF in EPA's Envirofacts Warehouse and Financial Data Warehouse for the 3 years ending September 30, 2001. We also reviewed relevant assistance agreements, amendments, and decision memoranda. We obtained information on the Congressionally-mandated awards from the project officers. Information on WERF's quality management procedures for research projects funded by EPA was obtained from interviews and a questionnaire sent to EPA employees serving on WERF research project subcommittees. We did not perform a financial audit of any of these awards, nor did we look at allowability of costs for any expenditures associated with these awards.

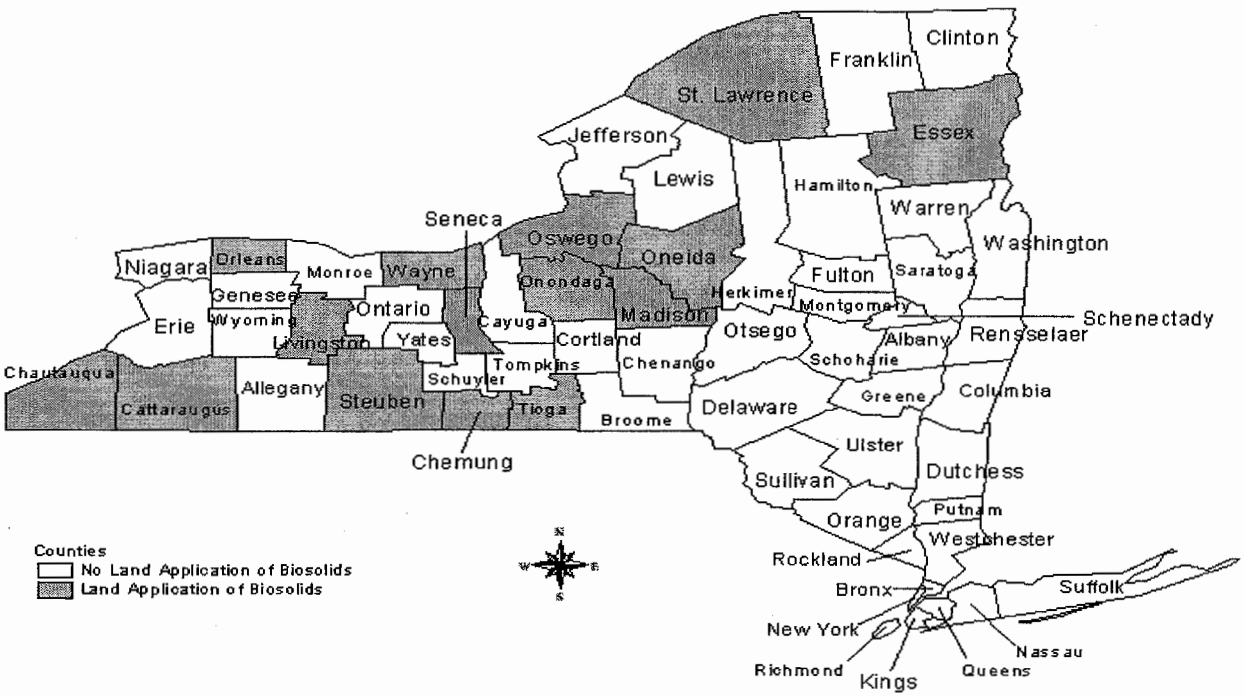
For a broader perspective on viewpoints and concerns outside of EPA and the States, we conducted interviews with or reviewed information from private citizens, members of the academic community, environmental groups, a farm bureau association, the U.S. Department of Agriculture, and the National Institute for Occupational Safety and Health. To understand industry concerns, we reviewed information from an industry trade organization and met with officials from a company in the land application business. We also toured a local wastewater treatment plant and interviewed officials and personnel responsible for plant operations.

Land Application Data for Seven States

Land application of biosolids varies by State, as well as by county within States. When we sought by-county data, we found that many States do not collect information by county on land application. However, we were able to obtain data on land application by county from seven States: Colorado, Florida, Maryland, New Jersey, New York, Virginia, and Wisconsin. This group of States includes a large importer of biosolids (Virginia); a large exporter of biosolids (New York); and a State to which EPA has delegated the biosolids program (Wisconsin).

The States provided data on counties that accept biosolids land application. These counties are shaded in gray on the State maps found on the following pages. States did not report land application for unshaded counties. The States in this group also provided state-wide data on the amount of sludge generated, amount land applied in-state, and number of sewage treatment plants (STPs). These data are presented in tables below the State maps. Some States provided data on acres used for land application and/or the dry metric tons (DMT) of biosolids that were land applied. Specific county data are presented in a second table below each map. Not all States were able to provide the same type of county data; therefore county data tables vary from State to State. Where possible, we differentiated between Class A, Class B, or exceptional quality (EQ) biosolids.

Land Application of Class B Biosolids in New York (2000)



State	Number of STPs	Biosolids Generated by STPs (DMT/yr)	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
New York	584	327,300	33,900*	14,812**	157,300

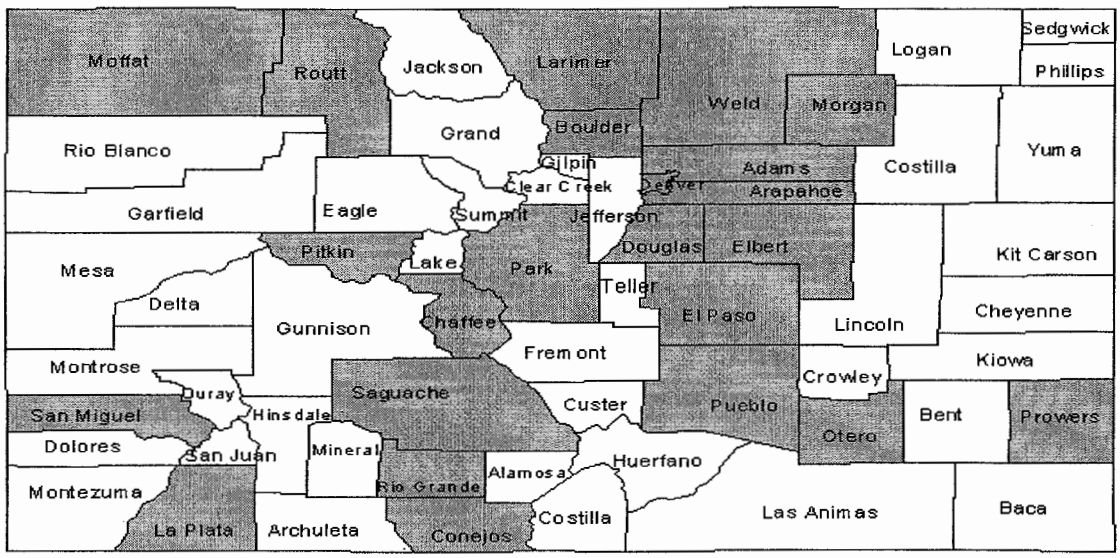
* 3,600 DMT Class B and 30,300 DMT Class A

** PA (86 DMT), MA (146 DMT), and NJ (14,580 DMT); Class A only

County*	Acres*	Quantity (DMT/yr)*
Essex	189	190
Oneida	230	160
St. Lawrence	410	250
Madison	492	1,400
Onondaga	66	20
Oswego	30	30
Tioga	280	200
Chemung	30	30
Livingston	50	30
Orleans	206	240
Seneca	79	70
Steuben	1,836	770
Wayne	43	110
Cattaraugus	60	90
Chautauqua	48	10
Total:	**4,049**	**3,600**

* County information is for Class B biosolids only

Land Application of Biosolids in Colorado (2000)



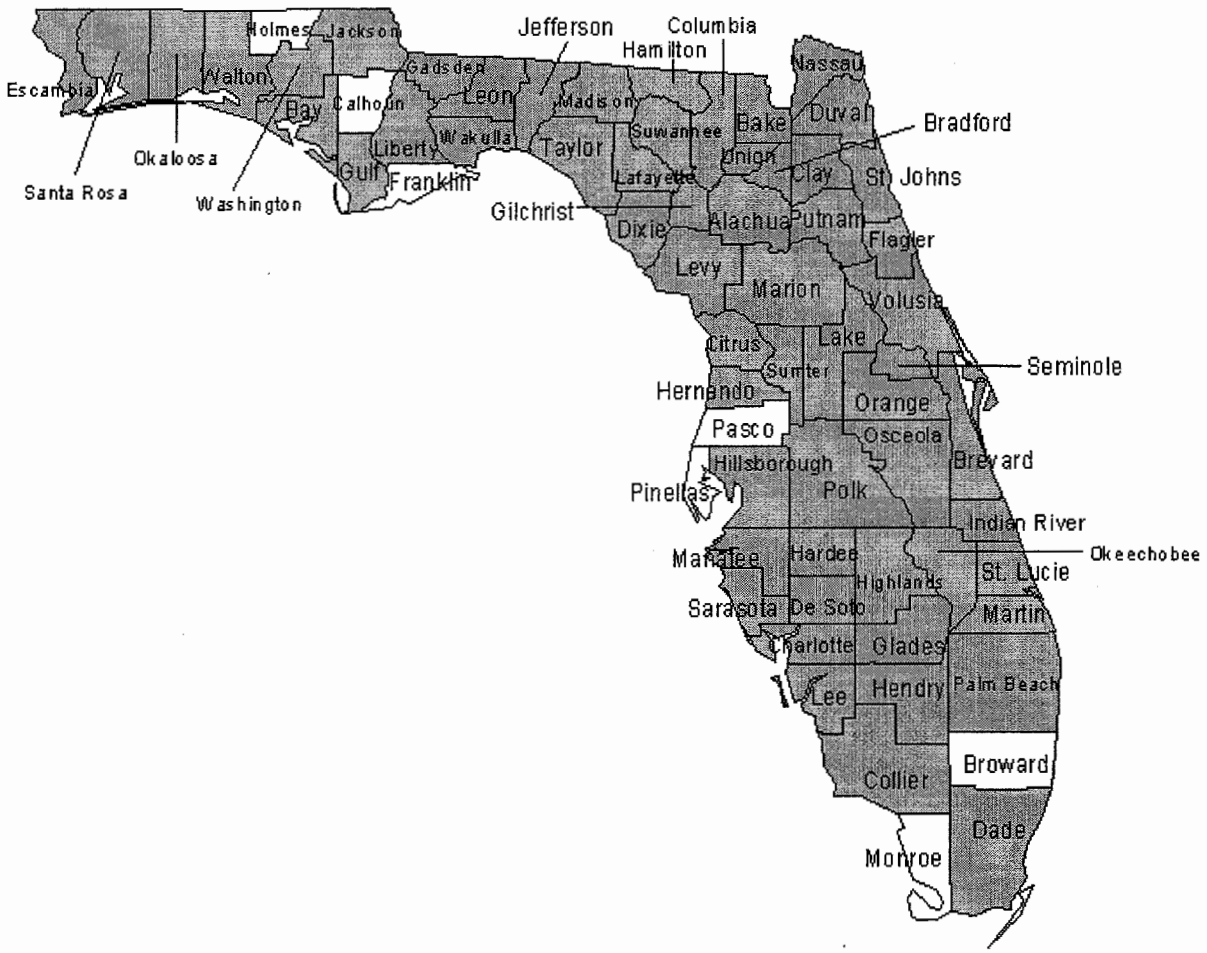
State	Number of STPs	Biosolids Generated by STPs (DMT/yr)	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
Colorado	219	59,842	49,358	14,371*	0

* Class B imported from NY and land applied in Prowers Co.

County	Acres*	Quantity (DMT/yr)
Adams	1,253	3,133
Arapahoe	10,192	25,481
Boulder	230	576
Chaffee	99	248
Conejos	82	204
Denver	44	109
Douglas	221	552
El Paso	41	102
Elbert	2,896	7,240
Larimer	482	1,205
La Plata	270	675
Moffat	70	174
Morgan	90	226
Otero	14	35
Park	6	16
Pitkin	30	74
Prowers	5,748	14,371
Pueblo	525	1,312
San Miguel	34	84
Rio Grande	774	1,936
Routt	187	469
Saguache	79	198
Weld	2,124	5,309
Total:	**25,492**	**63,729**

*Acres based on typical application rates

Land Application of Class B Biosolids in Florida (2000)

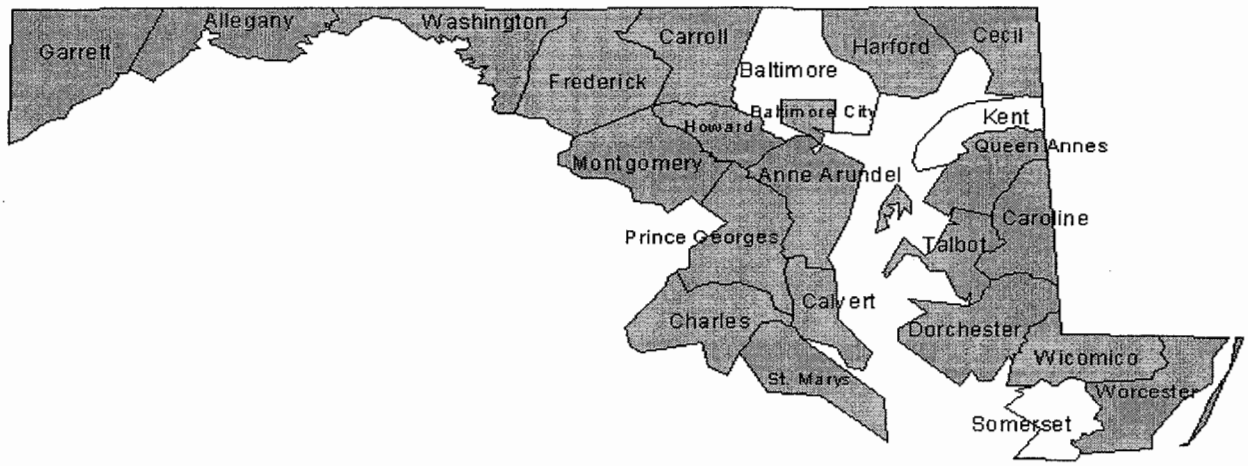


State	Number of STPs	Biosolids Generated by STPs (DMT/yr)	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
Florida	2,640	244,890	161,627*	0**	0

* Class B only

** Class AA (EQ) only; WI (13,791 DMT), NY (38,926 DMT), MD (13,646 DMT), MA (8,856 DMT), TX (23 DMT), and GA (3,507 DMT)

Land Application of Biosolids in Maryland (2000)



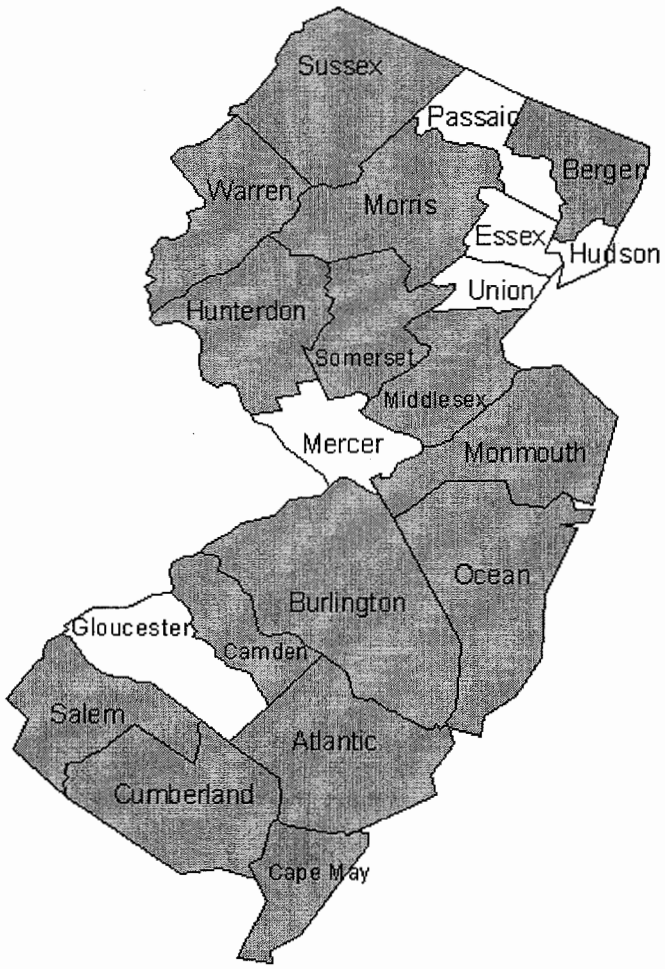
State	Number of STPs	Biosolids Generated by STPs (DMT/yr)	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
Maryland	307	131,998	79,971	14,946*	37,635**

* 23,578 DMT were imported and 8,633 DMT were stored for future use; DC (8,831 DMT), NJ (3,920 DMT), VA (5,501 DMT), PA (2,611 DMT), and WI (2,715 DMT)
** VA, WV, PA, DE, UT, and TN

County	Quantity (DMT/yr)
Allegany	820
Anne Arundel	840
Calvert	2,494
Caroline	3,235
Carroll	238
Charles	4,814
Dorchester	588
Fredrick	6,908
Garrett	18,116
Harford	2,732
Howard	1
Montgomery	70
Prince George's	3,833
Queen Anne's	2,657
St. Mary's	7,838
Talbot	682
Wicomico	510
Worcester	384
Baltimore City*	30,019
Cecil*	125
Washington*	1,131
Total:**	**88,035**

* Counties that received Class A only
** An additional 6,882 DMT were distributed as Class A (not tracked to a particular county)

Land Application of Biosolids in New Jersey (2000)



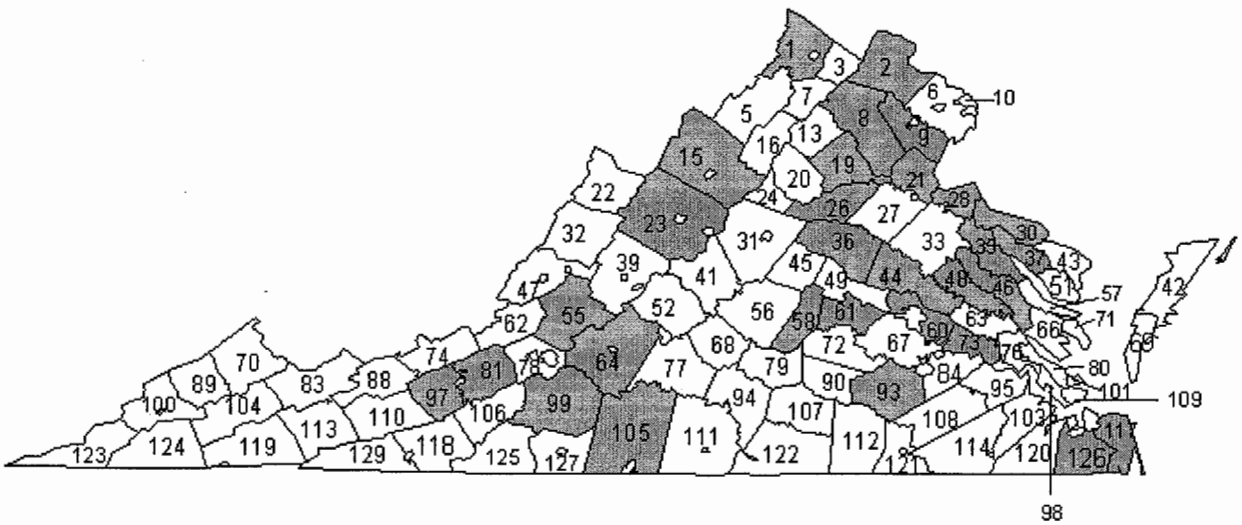
County	Acres for Class B Biosolids	Quantity* (DMT/yr)
Atlantic	0	789
Bergen**	0	8,423
Burlington*	339	9,736
Cumberland*	802	36,490
Hunterdon	0	572
Middlesex**	0	43,564
Monmouth	0	1,218
Morris	0	1,786
Ocean	0	862
Salem*	209	2,533
Somerset	0	95
Sussex	0	783
Warren	0	12,459
Atlantic/Camden*	393	2,041
Cape May/Salem	0	879
Cape May/Other NJ areas	0	1,947
Cumberland/Atlantic	0	133
Other NJ areas	0	64,662
Total:	**1,743**	**188,972**

* All quantities are Class A except: Burlington (998 DMT), Cumberland (1,371 DMT), Salem (1,654 DMT), and Atlantic/Camden (2,041 DMT)
** Used as landfill cover

State	Number of STPs	Biosolids Generated by STPs (DMT/yr)	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
New Jersey	332	320,000*	183,178**	5,794***	85,409****

* 230,000 DMT were generated, however, the amount increased to 320,000 DMT due to additives (lime)
** 177,114 DMT Class A and 6,064 DMT Class B
*** Class A only; NY (4,752 DMT), WI (226 DMT), PA (816 DMT)
**** Includes 4,060 DMT and another unknown amount processed in NJ from out-of-state sources in NY, PA, and CT; CT (333 DMT), Canada (679 DMT), WV (247 DMT), OH (2,231 DMT), MD (6,951 DMT), PA (5,490 DMT), NY (14,134 DMT), and VA (55,344 DMT)

Land Application of Biosolids in Virginia (2000)



Fredrick - 1, Loudoun - 2, Fauquier - 8, Prince William - 9, Rockingham - 15, Culpeper - 19, Stafford - 21, Augusta - 23, Orange - 26, King George - 28, Westmoreland - 30, Essex - 35, Louisa - 36, Richmond - 37, Hanover - 44, King and Queen - 46, King William - 48, Botetourt - 55, Cumberland - 58, Henrico - 60, Powhatan - 61, Bedford - 64, Charles City - 73, Montgomery - 81, Dinwiddie - 93, Pulaski - 97, Franklin - 99, Pittsylvania - 105, Virginia Beach - 117, Chesapeake - 126

State	Number of STPs	Biosolids Generated by STPs (DMT/yr)	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
Virginia	792	225,000	95,868	78,437*	< 1,000**

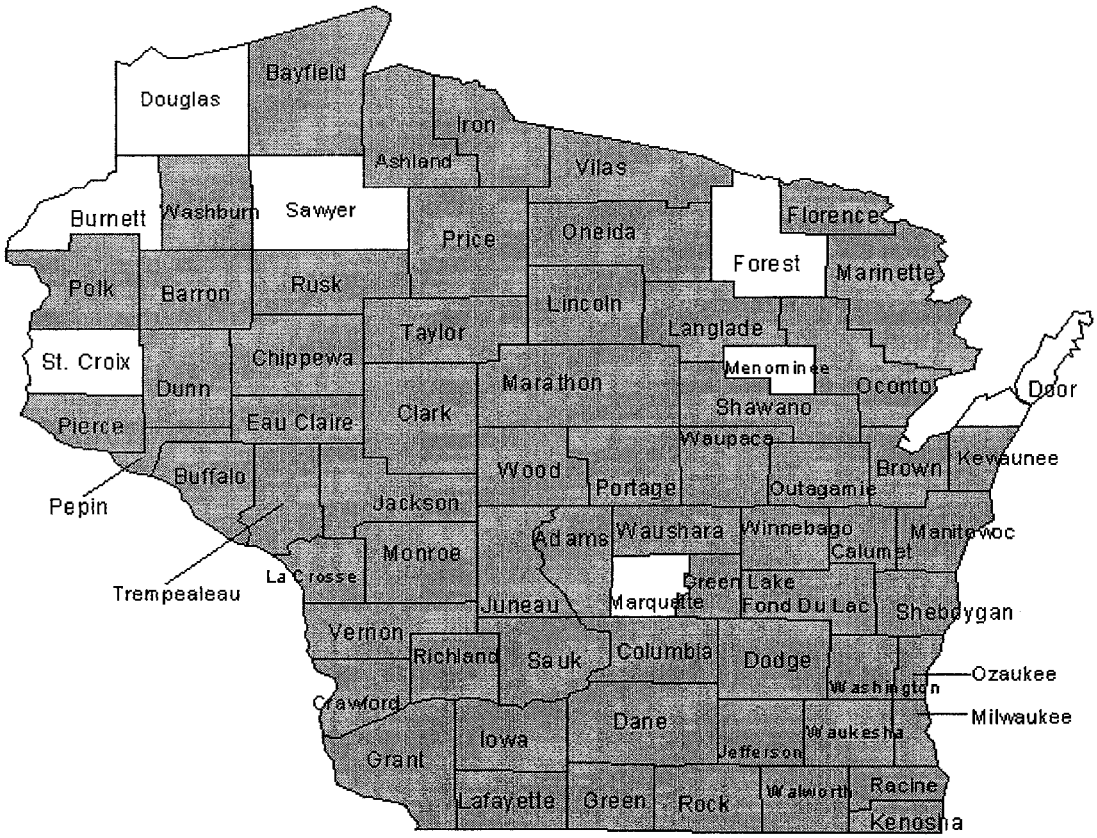
* MD, NJ, NY, and PA
** MD and NC

County	Acres	Quantity (DMT/yr)
Augusta*	215	394
Bedford	503	3,145
Botetourt	197	1,008
Charles City	1,287	5,938
Chesapeake*	288	1,201
Culpeper	5,759	30,495
Cumberland	2,745	10,693
Dinwiddie	1,291	7,342
Essex	1,266	5,416
Fauquier	2,050	11,352
Franklin	987	6,945
Fredrick	1,535	5,981
Hanover	1,430	6,630
Henrico	448	1,920
King & Queen	938	4,122
King George	822	5,639

County	Acres	Quantity (DMT/yr)
King William	3,717	13,403
Loudoun	1,300	4,436
Louisa	3,579	18,316
Montgomery*	164	292
Orange	1,967	9,490
Pittsylvania	1,681	3,045
Powhatan	122	475
Price William	227	1,426
Pulaski*	880	459
Richmond	345	1,465
Rockingham*	492	867
Stafford*	213	442
Virginia Beach*	560	2,060
Westmoreland	2,435	15,623
Total:	**39,443**	**179,561**

* County data not included in the land application State totals

Land Application of Biosolids in Wisconsin (2000)



State	Number of STPs	Biosolids Generated by STPs (DMT/yr)	Land Application of In-State Generated Biosolids (DMT/yr)	Land Application of Imported Biosolids (DMT/yr)	Exported Biosolids (DMT/yr)
Wisconsin	406	159,750*	84,725**	0	0***

* 75,000 DMT Class B and 50,000 DMT EQ

** Includes distributed EQ

*** Milwaukee is the only county that exports biosolids; EQ only (40,275 DMT)

Land Application of Biosolids in Wisconsin (2000)

County	Acres	Quantity (DMT/yr)
Adams	294	492
Ashland	32	171
Barron	364	328
Bayfield	11	14
Brown	230	460
Buffalo	11	8
Calulmet	134	152
Chippewa	376	521
Clark	389	279
Columbia	254	1,162
Crawford	151	202
Dane	4,737	11,655
Dodge	1,101	715
Dunn	395	368
Eau Claire	896	1,265
Florence	150	212
Fund du Lac	81	29
Grant	746	629
Green	369	693
Green Lake	163	89
Iowa	491	167
Iron	30	4
Jackson	63	32
Jefferson	491	126
Juneau	53	59
Kanosha	80	110
Kewaunee	10	6
La Crosse	1,175	1,594
Lafayette	197	43
Langlade	204	147
Lincoln	236	241
Manitowoc	932	1,526
Marathon	1,942	2,700

*County data is incomplete (missing 12,423 DMT/yr)

County	Acres	Quantity (DMT/yr)
Marinette	489	995
Milwaukee	2,014	6,162
Monroe	93	256
Oconto	126	721
Oneida	69	106
Outagamie	1,171	7,853
Ozaukee	526	776
Pepin	21	36
Pierce	83	4
Polk	152	142
Portage	641	649
Price	50	47
Racine	1,035	4,328
Richland	291	325
Rock	1,708	1,629
Rusk	85	6
Sauk	171	821
Shawano	136	201
Sheboygan	954	2,430
Taylor	442	192
Trempealeau	177	341
Vernon	162	80
Vilas	37	40
Walworth	747	1,050
Washburn	46	64
Washington	478	990
Waukesha	1,377	3,231
Waupaca	660	847
Waushara	10	11
Winnebago	969	10,395
Wood	1,048	1,376
Total*:	**32,460**	**72,302**

Agency Comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB -1 2002

OFFICE OF
WATER

MEMORANDUM:

SUBJECT: Draft Status Report on Land Application of Biosolids

FROM: G. Tracy Mehan, III /S/
Assistant Administrator

TO: Judith J. Vanderhoef, Project Manager
Headquarters Audit Division (2443)

Thank you for the opportunity to comment on your draft status report on land application of biosolids. Comments of the Office of Water are attached. Should you wish to discuss this matter further, please contact our Inspector General Liaison, Judy Hecht, at (202) 260-5682.

Attachments

cc Sylvia Lowrance
Henry Longest, II
Nikki Tinsley

- Page 1 - Introduction - 2nd paragraph:
  - At some point in the past, landfill space was limited and expensive. However, that is no longer universally true. Landfill space may be limited in some States, and some States limit or restrict disposal of sludge in landfills. EPA/OSWER still encourages recycling for other reasons, including reduced demand on available landfill space, reduced energy consumption, and reduced production of greenhouse gases.
  - revise the 3rd sentence (4th line) to read "As a result, land application of **treated sewage** sludge ..." [New words are in **bold.**]
- Page 1 - Background - 1st paragraph:
  - It would be better to say ". . .sludge may contain toxic pollutants . . . " instead of ". . . sewage sludge contains toxic pollutants . . . "
  - We suggest you revise the 2nd sentence (3rd line) to read "... have resulted in **the production of** large quantities of sewage sludge." [New words are in **bold.**]
- Page 2 - text immediately below chart
  - While it is correct to consider mosquitoes as vectors, mosquitoes are not usually attracted to biosolids. It might be best to eliminate the reference to mosquitoes here.
- Page 3 - Discussion of the 1990 GAO Report
  - It might be helpful to point out that this report was issued in the interim between issuance of the proposed and issuance of the final sludge regulations (40 CFR Part 503).
- Page 5 - Discussion of State Biosolids Issues
  - 1st paragraph, 3rd line: re-word the sentence tor read ". . . have received **formal** delegation from EPA." [New words are in **bold.**]
- Page 15 - Discussion of State Delegation
  - It would be more helpful to most readers if the references provided were to sections of the Clean Water Act rather than to sections of the United States Code.
  - You fail to point out that most state program requirements are now comparable or more restrictive that the Part 503 requirements, although you do include a quote from a member of the regulated community that "Many states also go beyond what is required in Part 503 with regard to management practices ..."
- Page 17 - top of page
  - We believe you may be referring to comments provided by Synagro Technologies, Inc. If so, check the date. Our copy is dated October 2, 2001. We're also aware that Synagro provided additional comments on November 13, 2001; you may want to address those

comments as well in your final report. Unless there's a specific reason for not doing so, we suggest you name the source of the comments.

- Page 18 - 1st full paragraph
    - Revise the paragraph to delete the reference to the Agency being practice-neutral with respect to biosolids management. The Agency does support beneficial reuse of biosolids, but it is the responsibility of local government to make local decisions regarding use and disposal options that are consistent with 40 CFR Part 503. As a result, we do not take an active role in choosing a specific use or disposal method.
- Page 18 & 19 - Discussion of Greg Kester's letters
    - Assistant Administrator Mehan answered Greg Kester's letter of September 10, 2001, on November 13, 2001. A copy of that response is attached.
    - There is no letter from Greg Kester dated October 2001. A letter Mr. Kester sent to Mike Cook in October 2000 may have been inadvertently dated 2001.
- Page 20 - 1st bullet concerning another joint meeting between States Headquarters, Regional Coordinators, and Regional Enforcement representatives
    - We expect to be able to provide funding for another annual biosolids meeting in 2002.
- Page 23
    - The meaning and intent of the last bullet on the page is not clear.
- Pages 28 - section titled "Water Environment Research Foundation"
    - 1st paragraph, 5th line ... the statement that "For each research project, a projects subcommittee (PSC) is formed of five to six outside experts typically from universities, municipalities, industry, and **sometimes** EPA" should be revised to add the "**sometimes**" since many of the WERF project PSC's have no EPA members. [New words are in **bold**.]
- Pages 29-36 - Discussion of the Science behind Part 503
    - The following supplement the red-line / strike out revision of this section which Al Rubin of OST provided to your staff of your [OIG] staff several weeks ago.
    - in the last paragraph of the section titled "Less Conservative Assumptions" you discuss the ORD allocation of $1 million for an ecological impact study which was begun in 1994 to address ecological effects, indicating that it was the only major study to address some of the research committed to in the Preamble. Actually, only a portion of the $1 million was ever allocated to the ecological impact study and additional funding was used to support hydrologic groundwater modeling efforts by the Athens R&D Lab that were eventually delivered to OST.
    - In the section on Class A vs. Class B Biosolids, the following statement (on page 35) is erroneous "These alternatives [Alternatives 3 and 4] have been criticized because the fact that certain indicator organisms are present or not present tells nothing about whether

there are other pathogenic organisms in the biosolids." The statement is erroneous because, for both alternatives, a demonstration must be made that there is an absence of Salmonella, Enteric virus, and viable helminth ova.

- There is a statement, on page 36, that reads, "In addition, endotoxins, toxic chemicals in bacteria which are not destroyed when bacteria are killed, also might be present in Class A biosolids." We believe you meant to say "... endotoxins and toxic chemicals in the biosolids which are not destroyed when bacteria are killed..."

Pages 36 / 37 - Discussion of Tracking and Investigating Health Complaints

- There are many errors in this discussion which should be corrected before you issue the final report. The errors are too numerous to address here. Call Bob Bastian (202-564-0653) for the details.

- Page 39 - very top of page
  - We suggest you consider naming the source of the comment.
  - Here you discuss and list county bans and restrictive ordinances, but fail to discuss the fact that at one time the State of New York had a 2 year moratorium on land application of biosolids (subsequently lifted), that there were a series of township bans passed in Wisconsin (subsequently overturned by the state).

- Page 41 in the section entitled Health Concerns
  - Here you discuss the NIOSH Hazard ID report and recommendations, but fail to mention that most of the NIOSH recommendations are routinely practiced by local POTWs and land application operations. You also fail to mention a follow-up article in the June/July'01 edition of *Water Environment Laboratory Solutions* (p.12-13). The article includes the following statement(s) "The LeSourdsville study misrepresents the facts, because the biosolids had pathogen levels exceeding Class B thresholds when workers experienced gastrointestinal problems. . . this key fact is missing in the reports and calls into question the legitimacy of claims based on them."

- Page 43 in the section entitled Economic Concerns
  - Here and elsewhere, you discuss the concerns of the California Farm Bureau, but fail to note that the Ohio Farm Bureau coordinated an in-depth study (in conjunction with the Ohio State University's Dept. of Pathobiology) of land application of Class B biosolids in Ohio, including an epidemiological study involving the general health of residents from 47 sludge-receiving farms compared with residents of 46 control farms for EPA/ORD's Water Engineering Research Lab. and Toxicology and Microbiology Div./Health Effects Research Lab. in Cincinnati (the final report *Demonstration of Acceptable Systems for Land Disposal of Sewage Sludge* was issued in 1985) that found the health of the farm families on farms receiving biosolids was as good if not better than the health of the control farm families.

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

September 10, 2001

The Honorable Christine Todd Whitman, Administrator
USEPA
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Subject: Biosolids Management

Dear Administrator Whitman:

I am the state biosolids coordinator for Wisconsin, and by consensus represent states on EPA's Biosolids Program Implementation Team (BPIT) and other general biosolids issues. This letter has been reviewed by other state biosolids coordinators and is sent with their overwhelming consensus agreement and support. I am writing to request that the biosolids program within EPA be granted additional funding and personnel to effectively implement this overburdened program. Of EPA's $7.8 billion dollar budget in FY 2001, only about $4 million or **0.05%** was devoted to biosolids staff and the program. That includes a $1 million dollar Congressional appropriation to the National Biosolids Partnership. At the same time approximately **40%** of the cost of wastewater treatment is expended on sludge treatment and management. This inequity has far-reaching consequences and places beneficial use in severe jeopardy. Beneficial use is a critical link to long-term sustainable wastewater treatment across the nation. Likewise state agencies should be given clear directives and finances to increase oversight in the biosolids program.

We also request that EPA support its research and regulations by releasing a position statement to again acknowledge the benefits of recycling this material. EPA, FDA, and USDA published an inter-agency agreement in 1981 with further affirmation and clarification in both 1984 and 1991, which promoted beneficial use as the preferred disposition of biosolids as opposed to landfilling or incineration.

Since the Agency promulgated the federal regulations for the use and disposal of sewage sludge in Title 40 of the Code of Federal Regulations, Part 503 (40 CFR part 503) on February 19, 1993, the resources devoted to the program have steadily declined. The agency had initially taken the position that biosolids applied to land presented a low risk for adverse effects to either public health or the environment and thus lowered the priority of the program and the resources devoted to it. Recent public forum events and criticism should force the Agency to reconsider the low priority rating and reallocate resources and staff to this program. The events include:

! A Congressional Hearing before the Committee on Science chaired by Congressman Sensenbrenner held on March 22, 2000.

- An audit report completed by the Office of the Inspector General (OIG) in 2000, at the request of the Office of Water to help them assess the program. A response was issued in June 2001 in which it is stated that many of the recommendations will not be funded.

- A new audit by the OIG has recently commenced at the request of the Whistleblower program.

- A National Academy of Science (NAS) review that concluded in a 1996 report that the 40 CFR part 503 regulations are protective and sludge can be used for food production crops *provided there is effective oversight to ensure the regulations are followed.*

- A second NAS study has been initiated this year which is again re-evaluating the rule development process and the science on which the regulations were based to determine if they are still adequate to protect human health in light of new research (I am serving on this committee). This study is also examining pathogen control and whether a risk based approach for pathogens should be pursued.

In addition:

- There have been allegations (largely championed by an EPA employee in the Whistleblower program) of human death due to biosolids application in at least two states. The state public health officials in those cases have not found any connection to biosolids, but the accusations persist.

- Allegations of animal deaths in at least two states, numerous negative newspaper and other media reports, and an increase in public complaints and concerns about the land application of biosolids.

While none of the allegations have yet to stand the test of scientific scrutiny, they all must be investigated and a response provided.

All of the above illustrate the need for effective oversight of this program, and the need for continued research, so the public can be assured that regulations are followed, updated, and public health and the environment are protected. An Agency budget of far less than one-tenth of one percent is unacceptable and represents an impossibility to effectively administer any program. The following general recommendations are respectfully offered for immediate action:

1. Staffing levels must be increased within EPA for the biosolids management program. A budget must exist which will allow for technical support to be offered by EPA, to states and the public. Headquarters is operating with a skeletal staff and must be augmented with additional staff and a budget to administer an effective program. The Office of Research and Development must be staffed at a level sufficient to conduct research and answer the myriad questions posed on emerging pathogens, and other pathogen and vector attraction control issues. Regional coordinators are directed to devote from zero to very little time on biosolids management. Retirement and transfers loom for many in the program and the institutional knowledge lost will be irreplaceable. New staff must be integrated into the program while that staff is still available.

2. The Pathogen Equivalency Committee (PEC) is a non-funded invaluable resource within the Agency that must be formally recognized, work-planned for, and budgeted. This Committee provides technical support for countless regulatory and regulated professionals across the world.

3. EPA should provide positive direction to states that biosolids should be elevated as a priority program and make funds available to states for this purpose. All states have some level of

oversight for biosolids but generally need to increase the level of resources for better program implementation.

4. A positive initiative EPA has funded annually for the past three years is a grant to conduct a joint state and federal regulator biosolids workshop. This workshop has provided unique opportunities to discuss the relevant issues in biosolids management and to develop strategies for more effective implementation. We would cordially request your attendance at the next workshop tentatively scheduled for June 24 – 27, 2002 in the Washington, DC area.

5. More specific recommendations are contained in 4 earlier letters I have sent to the Agency, dated October and February 2000, and November and October, 1998. Recommendations contained in those letters are still seen as vital to the program. I would be happy to provide you copies of these letters.

It is recognized that you have inherited the situation in which this program finds itself. It is hoped that you will have the vision to take action to save this important recycling program now. Thank you very much for your consideration of these requests and please don't hesitate to contact me at (608) 267-7611 or via email at kesteg@dnr.state.wi.us, with any questions or to discuss these issues further.

Sincerely,

/S/

Greg Kester, P.E.
State Residuals Coordinator

cc: Tracy Mehan – Assistant Administrator for Water, USEPA
Mike Cook – Director, Office of Wastewater Management, USEPA
Biosolids Program Implementation Team
Regional Coordinators
State Residuals Coordinators

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 1 3 2001

OFFICE OF
WATER

Mr. Gregg Kester, P.E.
State Residuals Coordinator
State of Wisconsin, Department of Natural Resources
101 S. Webster Street
Madison, WI 53707-7921

Dear Mr. Kester:

Thank you for your letter of September 10, 2001, to Administrator Christine Todd Whitman. You wrote to request that the Agency devote more resources to the biosolids program and issue a position statement reaffirming its support of beneficial reuse.

The Agency has only finite resources to discharge a large number and variety of responsibilities to address risks to the nation's water resources. The challenge, of course, is to use the available resources to reduce risk to human health and the environment in the most effective ways possible. EPA also believes that, within its resource constraints, EPA can best contribute to beneficial reuse by maintaining scientific knowledge and risk assessment capabilities; setting, enforcing, and revising standards; and providing tools for decision-making at the watershed level.

EPA's responsibility under Section 405 of the Clean Water Act is to develop management practices and numerical criteria for biosolids that will protect public health and the environment. We believe that Part 503 Rule provides protective criteria for the three use and disposal options covered by that rule: land application, incineration, and land disposal. EPA generally supports beneficial reuse of biosolids, but it is the responsibility of local government to make local decisions regarding use and disposal options that are consistent with the Part 503 rule. As you know, in order to assure that the 503 rule continues to reflect sound science, the National Academy of Sciences is currently conducting a review of the basis of the rule. We expect the results of that review in the next year.

Thank you for the invitation to attend next year's biosolid workshop. While I cannot commit now to attend given the demands and uncertainty of my schedule, I do want to say we strongly support these very productive workshops.

I would like to express my appreciation for your work on the Biosolids Program lmplementation Team. The participation of State governments is extremely valuable and cooperative efforts between the States and the Environmental Protection Agency (EPA), are the backbone of many programs, including oversight at biosolids management. If you have further questions or comments, please call Michael B. Cook, Director, Office of Wastewater Management, at (202)-564-0748.

Sincerely,

/S/

G. Tracy Mehan, III
Assistant Administrator

Distribution

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Regional Biosolids Coordinators
Regional Audit Liaisons

National Research Council
National Institute for Occupational Safety and Health

State Biosolids Coordinators
The National Whistleblower Center
Synagro Technologies, Inc.

Requests for up to five copies of this report may be sent to:

U.S. Environmental Protection Agency
Headquarters Audit/Evaluation Resource Center (2443)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

This report is also available from the internet site:

http://www.epa.gov/oigearth/eroom.htm

LOGAN COUNTY WATER POLLUTION CONTROL DISTRICT
REPORT ON TREATMENT SYSTEM UPGRADES, INCLUDING, FINE SCREENS, EQUALIZATION BASINS, UV DISINFECTION, BELT FILTER PRESS AND SEPTAGE RECEIVING STATION. PERMIT TO INSTALL # 597728, LOGAN COUNTY

Introduction

An application for a Permit to Install (PTI #597728) was received in the Southwest District Office on December 18, 2006. The application was submitted by the Logan County Water Pollution Control District. This application is part of a phase one collection and treatment system upgrade designed to eliminate collection system overflows. The application is for the installation of a new lift station and force main (24") in the slough area. Treatment system upgrades include the addition of (2) fine screens, (1) equalization tank (1.55 million gallons), conversion of the existing primary clarifiers to equalization (507,000 gallons), UV disinfection, conversion of the anaerobic digestion system to aerobic holding (including the conversion of the existing primary anaerobic digester to aerobic holding, installation of a new 50' dia. x 20' aerobic holding tank, demolition of two secondary anaerobic digester), addition of a belt filter press, and a septage receiving station. This upgrade also will involve replacement of the influent comminutors, four influent pumps, aeration diffusers (currently ceramic, replace with membrane disc) part of the block baffle walls in the chlorine contact tank, rehabilitation work on the RAS and WAS pumps, and rehabilitation work on the sludge holding tank. The design flow and loadings at the Indian Lake WWTP will not increase. So antidegradation is not applicable. The Indian Lake WWTP is located at 1015 Orchard Island Road South, Russells Point, Ohio.

Existing Facilities

The Indian Lake WWTP consist of influent pump station, comminutors, bar screen, preaeration, grit removal, primary clarifiers, activated sludge aeration, secondary clarifiers, chlorine contact tank, dechlorination and step aeration. The average daily design flow for the system is 4.6 MGD.

Summary of New Facilities

1. Preliminary Treatment

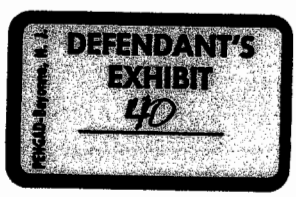
   All plant influent flows, influent pump station and slough lift station, will combine in the influent channel for transport to two new influent screens. The screens are fine screens (3 mm openings) with automatic rakes. Screenings will be conveyed to a dumpster for disposal as part of the plants solid waste stream. The system is designed to treat 16 MGD.

2. Flow Splitter Box

   From the screens flow will enter a new splitter box. Flows up to 4.6 MGD will be sent directly to aeration system. The splitter box has four overflow weirs. Flows above 4.6 MGD will be directed to the non aeration equalization tanks (existing primary clarifiers, capacity 507,000 gallons). When the high level in these EQ tanks is reached a plug valve will start to close. This sends flow over the second set of weirs to the new 1.55 million gallon three compartment equalization basin. This tank fills in series. The third compartment in this tank has an overflow to the existing chlorine contact tank. After flows subside, equalized flows will be sent to the EQ lift station (VFD pumps provided) for return to the splitter box and ultimately to aeration.

3. Flow Equalization

   A new 1.55 million gallon (concrete) flow equalization tank will be installed as part of the treatment upgrade. The tank will have three compartments. Each compartment will be 115' x 50' x 12' (SWD). There will be two surface mechanical mixers / aerators in each compartment. Each mixer will have a 10 horse power motor that operates a 11.5" propeller. A pivotal mooring system with two support cables will be used to hold the mixers in place. Equalized flows will pass through the three compartments in series prior to discharge to the chlorine contact tank and / or aeration system.



4. Disinfection

In conjunction with the existing chlorine disinfection system a new UV disinfection system will be installed as part of the upgrade. All flows from the secondary treatment system will be sent to the new UV system. A new 1' x 30' concrete channel will house six modules. Each module will contain 8 lamps. The units are set to produce an ultraviolet transmittance of 254 NM at 65%. The system is designed to treat 4.6 MGD.

5. Aerated Sludge Holding

As part of the sludge handling facilities upgrade the existing primary anaerobic digester will be converted to an aerobic sludge holding tank. A second tank 50' diameter x 20' SWD will be installed creating a total holding volume 587,000 gallons. There will be a total of 57 days retention time in the system. A coarse bubble diffuser system will be installed in the tanks. Three positive displacement blowers will provide 1546 cfm of air at 120 psi.

Solids Handling Building

A new solids handling building will be constructed to contain a new belt filter press and septage receiving / dewater system. The building will house a new 2 meter belt press. The press has a design feed rate of 1200 lb solids per hour with an output of 18 to 20 % solids. Pressed solids will be conveyed to two bays which house two 20 cubic yard dumpsters. The bays provide a total of 75 days of storage. Pressed solids will be land filled. The new septage receiving station will have a mechanical screen, rock trap, dewatering auger with wash water, solids disposal container, flow meter (magnetic meter on 4" inlet line) and two holding tanks (15.6' x 9.8' with SWD of 4.8'). A four inch cam and grove connection will be provided at the building for direct connection to the system. Magnetic swipe cards will be used to collect hauler information. This date will be collected and stored as part of the Programmable Logic Control system provided. Septage discharged to the system will be ground and washed as it passes through the filter and screening systems. Washed solids will be collected in a container for disposal with the facility solid waste. Liquids and residual organic / inorganic material will be discharged to the holding system prior to discharge to the plant influent.

Design Criteria

Design Flow – 4.6 MGD
CBOD5 - 15.0 mg/l (summer)
Sus. Sol. - 20.0 mg/l (summer)
NH3 – 1.5 mg/l (summer)

Cost of Construction

The construction cost of this upgrade is $8,068,000.00

The plans are satisfactory and are recommended for approval with the standard set of conditions.

Joseph Reynolds
Division of Surface Water

Richard L. Shoemaker, P.E.
Division of Surface
Permits Supervisor