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State of North Carolina  
 Department of Environment, Health, and Natural Resources  
 512 North Salisbury Street • Raleigh, North Carolina 27604

**DIVISION OF SOLID WASTE MANAGEMENT**

James B. Hunt, Jr., Governor

TELEPHONE: (919) 733-0692

Jonathan B. Howes, Secretary

July 7, 1993

Mr. Robert C. Smith  
 County Manager, Alamance County  
 124 West Elm St.  
 Graham, N.C. 27253

Re: Implementation Of Subtitle 'D' Ground-water Monitoring Program

Dear Mr. Smith,

The purpose of this correspondence is to provide information and clarification on the changes in ground-water monitoring requirements for MSWLF facilities that remain in operation after October 9, 1993. The proposed North Carolina Solid Waste Management Rules reflect significant changes for ground-water monitoring based on requirements of the E.P.A. Subtitle D Rules.

Attachment A to this letter provides a summary of important dates and significant activities that must be accomplished in order to be in compliance with the new rules. Attachment B contrasts existing and proposed ground-water monitoring and assessment requirements based on changes in the rules. Because of significant increases in costs that will be incurred in order to operate a MSWLF under the new Subtitle D Rules, including financial assurance and increased costs for ground-water monitoring and assessment, you may wish to seriously consider closing your sanitary landfill prior to October 9, 1993, when the new rules become effective.

Based on past ground-water monitoring data for the Alamance County landfill, there are already documented violations of North Carolina Groundwater Quality Standards at some of the detection monitoring wells. A copy of your most recent sampling analytical data is attached on which highlighting has been done for the Appendix I constituents that exceed the Groundwater Quality Standards. Therefore, when the new rules take effect, Alamance County will quickly be required to implement assessment monitoring for all Appendix II constituents. Since the Groundwater Quality Standards are also used in establishing the ground-water protection standards, you may also rapidly move into assessment of corrective action

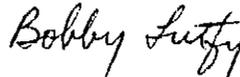
alternatives based on a full-scale ground-water investigation to determine the nature and extent of contamination at the site.

If Alamance County chooses to continue to operate their MSWLF facility after October 9, 1993, then you need to begin planning and budgeting immediately for the activities outlined in Attachment A. A revised Water Quality Monitoring Plan must be submitted as part of the Transition Plan on or before April 9, 1994. All background sampling and related activities for the upgraded monitoring system must be completed and reported to the Division in order to demonstrate compliance with the new water quality monitoring requirements on or before October 9, 1994.

Please note that the goals and objectives for ground-water assessment monitoring and ground-water contamination investigations are the same under both the current and the proposed rules and shall be accomplished in a way that is protective of human health and the environment. However, current rules allow for greater flexibility in the assessment and investigation activities and the sample analytical costs could be substantially less using the constituent list required under current rules and policy as compared to analytical costs required by the new rules based on Subtitle D, which require sampling for the Appendix II list of constituents.

I hope this letter has been helpful in providing you more insight into the actions that will be required by Alamance County to maintain compliance with the water quality monitoring requirements of the Solid Waste Management Rules as we make the transition to the new rules growing out of the E.P.A. Subtitle D Regulations. If you have any questions or comments regarding this letter, please contact the Solid Waste Section at (919) 733-0692.

Sincerely,



Bobby Lutfy, Hydrogeologist

Solid Waste Section

cc: Hugh Jernigan

Attachments

## ATTACHMENT A

Important dates and significant activities that must be accomplished in order to be in compliance with the new rules on ground-water monitoring at MSWLF facilities:

April 9, 1994: A Water Quality Monitoring Plan that fulfills the requirements of the new Solid Waste Management Rules must be submitted to the Division as part of the Transition Plan on or before April 9, 1994.

October 9, 1994: Compliance with the new ground-water monitoring requirements must be demonstrated to the Division on or before October 9, 1994. In order to demonstrate compliance, the MSWLF owner or operator must perform the following activities and provide documentation to the Division.

1. Upgrade the ground-water monitoring system so that it meets the criteria of the new rules for monitoring systems.  
Rule .1631
  - (a) Monitoring wells shall be installed at the relevant point of compliance based upon the waste boundaries established on October 9, 1993. - Rule .1631(a)(2)
  - (b) Monitoring wells shall be designed and constructed in accordance with the applicable North Carolina Well Construction Standards as codified in 15A NCAC 2C. - Rule .1631(b)
2. In order to accurately determine ground-water elevations for each monitoring well, the wells shall have been accurately surveyed by a North Carolina Registered Land Surveyor.  
- Rule .1632(d)(1)
3. In order to determine the rate of ground-water flow, the owner or operator shall provide data for hydraulic conductivity and porosity for the formation materials at each of the well locations. - Rule .1632(d)(2)
4. A minimum of four independent samples from each well (background and downgradient) shall be collected and analyzed for the Appendix I constituents during the first semiannual sampling event. - Rule .1633(b)
5. The owner or operator shall determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular ground-water monitoring program that applies to the MSWLF unit. - .1632(i)

ATTACHMENT B

Contrasts between the existing and proposed ground-water monitoring and assessment requirements based on changes in the Solid Waste Management Rules. All MSWLF units that are in operation on or after October 9, 1993, will be subject to the new rules.

EXISTING RULES

NEW RULES

Detection monitoring:

Monitoring frequency:  
Semiannual monitoring

Monitoring frequency:  
Semiannual monitoring

Monitoring parameters:  
23 landfill constituents

Monitoring parameters:  
Appendix I constituents

Data evaluation based on:  
N.C. Groundwater Quality  
Standards

Data evaluation based on:  
N.C. Groundwater Quality  
Standards and statistical  
increase over background  
levels

Post Closure Monitoring:

Length of time:  
5 years and reevaluate need  
for further monitoring

Length of time:  
30 years and reevaluate need  
for further monitoring

Monitoring parameters:  
23 landfill constituents &  
occasional VOCs

Monitoring parameters:  
Appendix I constituents

Data evaluation based on:  
N.C. Groundwater Quality  
Standards

Data evaluation based on:  
N.C. Groundwater Quality  
Standards and statistical  
increase over background  
levels

Assessment monitoring and ground-water investigations:

Monitoring parameters:  
23 landfill constituents,  
VOCs, semi-VOCs

Monitoring parameters:  
Appendix II constituents  
(213 constituents)

Data evaluation based on:  
N.C. Groundwater Quality  
Standards

Data evaluation based on:  
N.C. Groundwater Quality  
Standards and statistical  
increase over background  
levels

Greater flexibility

Flexibility more limited



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WORK ORDER NUMBER(S): 93-04-447-01

##	ANALYTE	ML	CONC. (ug/L)	##
43	HEXANONE, 2- (MBK)	20.0	*	43
44	IODOMETHANE	4.0	*	44
45	ISOPROPYLBENZENE (CUMENE)	4.0	*	45
46	ISOPROPYLTOLUENE, para-	4.0	*	46
47	NAPHTHALENE	4.0	*	47
48	PENTANONE, 4-METHYL-2- (MIBK)	20.0	*	48
49	PROPANE, 1,2-DIBROMO-3-CHLORO- (DBCP)	4.0	*	49
50	PROPYLBENZENE, n-	4.0	*	50
51	STYRENE	10.0	*	51
52	TETRACHLOROETHANE, 1,1,1,2-	4.0	*	52
53	TETRACHLOROETHANE, 1,1,2,2-	4.0	*	53
54	TETRACHLOROETHENE 0.7	4.0	4.7	54
55	TOLUENE	4.0	*	55
56	TRIBROMOMETHANE (BROMOFORM)	4.0	*	56
57	TRICHLOROBENZENE, 1,2,3-	4.0	*	57
58	TRICHLOROBENZENE, 1,2,4-	4.0	*	58
59	TRICHLOROETHANE, 1,1,1-	4.0	*	59
60	TRICHLOROETHANE, 1,1,2-	4.0	*	60
61	TRICHLOROETHENE	4.0	*	61
62	TRICHLOROFLUOROMETHANE	4.0	*	62
63	TRICHLOROMETHANE (CHLOROFORM)	4.0	*	63
64	TRICHLOROPROPANE, 1,2,3-	4.0	*	64
65	TRIMETHYLBENZENE, 1,2,4-	4.0	*	65
66	TRIMETHYLBENZENE, 1,3,5-	4.0	*	66
67	VINYL ACETATE	30.0	*	67
68	VINYL CHLORIDE	4.0	*	68
69	XYLENES (TOTAL)	4.0	*	69

\*BELOW QUANTITATION LIMITS EXCEPT WHERE NOTED

8240VOA.LIQ  
Revised 6/91



EPA 8240/8260 VOLATILE ORGANICS ANALYSIS BY GC/MS - LIQUIDS

WORK ORDER NUMBER(S): 93-04-447-04

METHOD QUANTITATION LIMIT (MQL): See below

##	ANALYTE	MQL	CONC. (ug/L)	##
1	ACETONE	100.0	*	1
2	ACROLEIN	10.0	*	2
3	ACRYLONITRILE	10.0	*	3
4	BENZENE	4.0	8.1	4
5	BROMOBENZENE	4.0	*	5
6	BROMOCHLOROMETHANE	4.0	*	6
7	BROMODICHLOROMETHANE	4.0	*	7
8	BROMOMETHANE	4.0	*	8
9	BUTANONE, 2- (MEK)	30.0	*	9
10	BUTENE, 1,4-DICHLORO-2-	100.0	*	10
11	BUTYLBENZENE, n-	4.0	*	11
12	BUTYLBENZENE, sec-	4.0	*	12
13	BUTYLBENZENE, tert-	4.0	*	13
14	CARBON DISULFIDE	20.0	*	14
15	CARBON TETRACHLORIDE	4.0	*	15
16	CHLOROBENZENE	4.0	*	16
17	CHLOROETHANE	4.0	*	17
18	CHLOROETHYL VINYL ETHER, 2-	4.0	*	18
19	CHLOROMETHANE	4.0	4.2	19
20	CHLOROTOLUENE, 2-	4.0	*	20
21	CHLOROTOLUENE, 4-	4.0	*	21
22	DIBROMOCHLOROMETHANE	4.0	*	22
23	DIBROMOETHANE, 1,2- (EDB)	4.0	*	23
24	DIBROMOMETHANE	4.0	*	24
25	DICHLOROBENZENE, 1,2-	4.0	*	25
26	DICHLOROBENZENE, 1,3-	4.0	*	26
27	DICHLOROBENZENE, 1,4-	4.0	*	27
28	DICHLORODIFLUOROMETHANE	100.0	*	28
29	DICHLOROETHANE, 1,1- 700 (2L draft)	4.0	43.6	29
30	DICHLOROETHANE, 1,2-	4.0	*	30
31	DICHLOROETHENE, 1,1-	4.0	*	31
32	DICHLOROETHENE, cis-1,2-	4.0	253	32
33	DICHLOROETHENE, trans-1,2-	4.0	*	33
34	DICHLOROMETHANE (METHYLENE CHLORIDE)	4.0	99.6	34
35	DICHLOROPROPANE, 1,2-	4.0	*	35
36	DICHLOROPROPANE, 1,3-	4.0	*	36
37	DICHLOROPROPANE, 2,2-	4.0	*	37
38	DICHLOROPROPENE, 1,1-	4.0	*	38
39	DICHLOROPROPENE, cis-1,3-	4.0	*	39
40	DICHLOROPROPENE, trans-1,3-	4.0	*	40
41	ETHYLBENZENE	4.0	*	41
42	HEXACHLOROBUTADIENE	4.0	*	42



WORK ORDER NUMBER(S) : 93-04-447-04

##	ANALYTE	ML	CONC. (ug/L)	##
43	HEXANONE, 2- (MBK)	20.0	*	43
44	IODOMETHANE	4.0	*	44
45	ISOPROPYLBENZENE (CUMENE)	4.0	*	45
46	ISOPROPYLTOLUENE, para-	4.0	*	46
47	NAPHTHALENE	4.0	*	47
48	PENTANONE, 4-METHYL-2- (MIBK)	20.0	*	48
49	PROPANE, 1,2-DIBROMO-3-CHLORO- (DBCP)	4.0	*	49
50	PROPYLBENZENE, n-	4.0	*	50
51	STYRENE	10.0	*	51
52	TETRACHLOROETHANE, 1,1,1,2-	4.0	*	52
53	TETRACHLOROETHANE, 1,1,2,2-	4.0	*	53
54	TETRACHLOROETHENE 0.7	4.0	156	54
55	TOLUENE	4.0	*	55
56	TRIBROMOMETHANE (BROMOFORM)	4.0	*	56
57	TRICHLOROBENZENE, 1,2,3-	4.0	*	57
58	TRICHLOROBENZENE, 1,2,4-	4.0	*	58
59	TRICHLOROETHANE, 1,1,1-	4.0	*	59
60	TRICHLOROETHANE, 1,1,2-	4.0	*	60
TCE 61	TRICHLOROETHENE 2.8	4.0	48.8	61
62	TRICHLOROFLUOROMETHANE	4.0	*	62
63	TRICHLOROMETHANE (CHLOROFORM)	4.0	*	63
64	TRICHLOROPROPANE, 1,2,3-	4.0	*	64
65	TRIMETHYLBENZENE, 1,2,4-	4.0	*	65
66	TRIMETHYLBENZENE, 1,3,5-	4.0	*	66
67	VINYL ACETATE	30.0	*	67
68	VINYL CHLORIDE .015	4.0	13.4	68
69	XYLENES (TOTAL)	4.0	*	69

\*BELOW QUANTITATION LIMITS EXCEPT WHERE NOTED

8240VOA.LIQ  
Revised 6/91



**ANALYTICAL REPORT**

**CUSTOMER:** ALAMANCE COUNTY LANDFILL  
**FACILITY:** 124 West Elm Street  
**REPORT TO:** Mr. Alvin Cagle  
  
**SAMPLE:** April Well Monitoring  
 MW-7A Grab 4/23/93

**WORK ORDER #:** 93-04-447-10  
  
**COLLECTED:** 04/23/93  
**RECEIVED:** 04/23/93  
**REPORTED:** 05/21/93

PARAMETER	METHOD	STARTED	ANALYZED	RESULT
BOD, 5-Day	EPA 405.1	04/23/93	04/29/93	3.9 mg/L
Chemical Oxygen Demand	EPA 410.4	04/27/93	04/27/93	<20.0 mg/L
Chloride	EPA 325.2	04/28/93	04/28/93	3.2 mg/L
EPA 8240, Volatiles, Liquid	EPA8240/8260	04/30/93	05/01/93	Attached
Fluoride	EPA 340.2	04/30/93	04/30/93	0.12 mg/L
Nitrate, Nitrogen	EPA 353.1	05/11/93	05/11/93	<0.10 mg/L
pH (Field Determination)	SM 16 423	04/23/93	04/23/93	6.21 SU
Solids, Total Dissolved	EPA 160.1	04/26/93	04/27/93	420 mg/L
Specific Conductance	EPA 120.1	04/23/93	04/23/93	151 umhos/cm @ 25C
Sulfate	EPA 375.4	04/29/93	04/29/93	<75.0 mg/L
Total Organic Carbon, Liq.	EPA 415.1	05/05/93	05/05/93	Attached
Total Organic Halides, LIQ.	EPA 9020	04/30/93	04/30/93	Attached
Arsenic, Total by GF	EPA 206.2	05/14/93	05/18/93	<0.005 mg/L
Barium, Total	EPA 208.1	05/12/93	05/19/93	<0.1 mg/L
Cadmium, Total	EPA 213.1	05/12/93	05/14/93	0.008 mg/L
Chromium, Total	EPA 218.1	05/12/93	05/14/93	<0.05 mg/L
Copper, Total	EPA 220.1	05/12/93	05/14/93	<0.01 mg/L
Iron, Total	EPA 236.1	05/12/93	05/19/93	1.4 mg/L
Lead, Total	EPA 239.1	05/12/93	05/18/93	<0.05 mg/L
Manganese, Total	EPA 243.1	05/12/93	05/17/93	0.02 mg/L
Mercury, Total	EPA 245.1	05/11/93	05/13/93	<0.0002 mg/L
Selenium, Total by GF	EPA 270.2	05/14/93	05/19/93	<0.005 mg/L
Silver, Total	EPA 272.1	05/12/93	05/19/93	<0.01 mg/L
Zinc, Total	EPA 289.1	05/12/93	05/18/93	<0.005 mg/L