29IHSSF1045

DocumentID NONCD0002873

Site Name NELLO TEER QUARRY-DENFIELD

DocumentType Remedial Action Plan (RAP)

RptSegment 2

DocDate 9/29/1995

DocRcvd 2/20/2007

Box SF1045

AccessLevel PUBLIC

Division WASTE MANAGEMENT

Section SUPERFUND

Program IHS (IHS)

DocCat FACILITY

Site Ranking
110

PLRO

2/2

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SEP 29 1995
FR RALEIGH REGIONAL OFFICE

Corrective Action Plan Addendum
Nello Teer Quarry
Denfield Road
Durham, North Carolina
September 29, 1995

9357

Prepared for

Nello Teer
Denfield Road
Durham, North Carolina
Front Royal Project No. 0013-94-012

Prepared by

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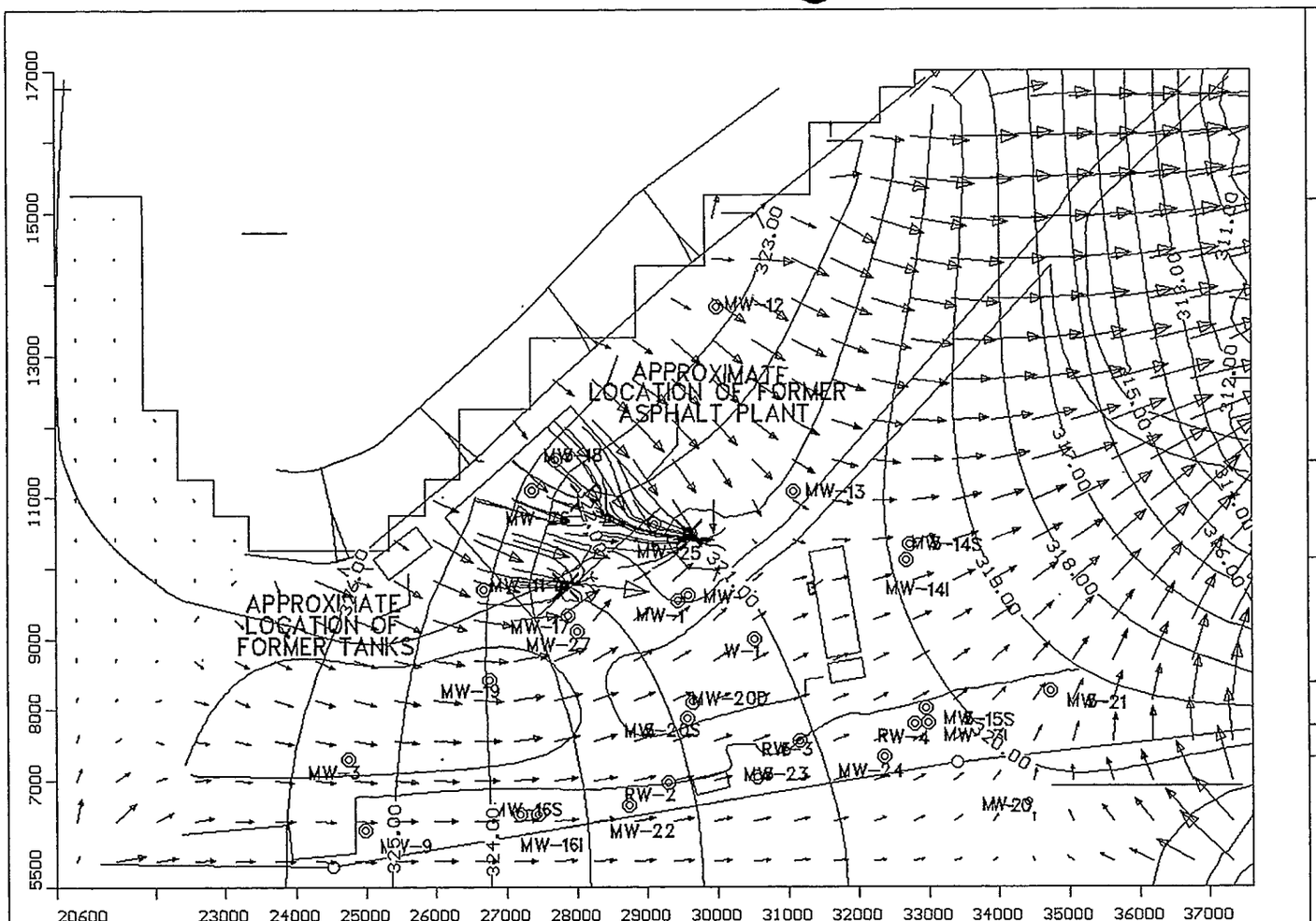
PART 2/2



FLOWPATH 5.03

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Model Dimensions

No. rows	: 25
No. columns	: 36
No. pumps	: 3
No. injct	: 0
No. const. heads	: 43
No. const. flux	: 0
No. river nodes	: 0
No. drain nodes	: 0

Hydraulic Heads (ft)

Min :	308.000
Max :	328.000

Velocities (ft/d)

Min :	0.000
Max :	0.096
Avg :	0.020

Units : [ft][day]

Data Set : TEERCHC

E C H O P R I N T
F L O W P A T H
version 5.0
FLOWPATH was written by Thomas Franz and Nilson Guiguer
Copyright 1989-1994
by
Waterloo Hydrogeologic Software
200 Candlewood Crescent
Waterloo, Ontario
N2L 5Y9, Canada
ph (519) 746-1798

FLOWPATH logbook for data set : TEERCHC

Unit System : English units [ft/gal/d]

***** GRID PARAMETERS *****

Number of x-grid lines : 36 Number of y-grid lines : 25

Grid coordinates (x-grid lines) [ft] :

1	2.060E+0004
2	2.110E+0004
3	2.160E+0004
4	2.210E+0004
5	2.260E+0004
6	2.310E+0004
7	2.360E+0004
8	2.410E+0004
9	2.460E+0004
10	2.510E+0004
11	2.560E+0004
12	2.610E+0004
13	2.660E+0004
14	2.710E+0004
15	2.760E+0004
16	2.785E+0004
17	2.810E+0004
18	2.860E+0004
19	2.910E+0004
20	2.960E+0004
21	3.010E+0004
22	3.060E+0004
23	3.110E+0004
24	3.160E+0004

25	3.210E+0004
26	3.260E+0004
27	3.310E+0004
28	3.360E+0004
29	3.410E+0004
30	3.460E+0004
31	3.510E+0004
32	3.560E+0004
33	3.610E+0004
34	3.660E+0004
35	3.710E+0004
36	3.760E+0004

Grid coordinates (y-grid lines) [ft] :

1	5.500E+0003
2	6.000E+0003
3	6.500E+0003
4	7.000E+0003
5	7.500E+0003
6	8.000E+0003
7	8.500E+0003
8	9.000E+0003
9	9.500E+0003
10	9.750E+0003
11	1.000E+0004
12	1.050E+0004
13	1.100E+0004
14	1.150E+0004
15	1.200E+0004
16	1.250E+0004
17	1.300E+0004
18	1.350E+0004
19	1.400E+0004
20	1.450E+0004
21	1.500E+0004
22	1.550E+0004
23	1.600E+0004
24	1.650E+0004
25	1.700E+0004

***** WELL PARAMETERS *****

Number of wells : 3

No.	i	j	X [ft]	Y [ft]	well discharge [gpd]
1	20	12	2.960E+0004	1.050E+0004	-3.600E+0003
2	17	13	2.810E+0004	1.100E+0004	-3.600E+0003
3	16	10	2.785E+0004	9.750E+0003	-3.600E+0003

***** CONSTRAINED HEAD NODES *****

Number of constant head nodes : 43

No.	i	j	X [ft]	Y [ft]	const. head [ft]
1	15	17	2.762E+0004	1.299E+0004	3.250E+0002
2	15	16	2.762E+0004	1.252E+0004	3.250E+0002
3	14	15	2.711E+0004	1.201E+0004	3.250E+0002
4	13	15	2.660E+0004	1.201E+0004	3.250E+0002
5	13	14	2.660E+0004	1.150E+0004	3.250E+0002
6	12	13	2.610E+0004	1.100E+0004	3.260E+0002
7	11	12	2.559E+0004	1.049E+0004	3.260E+0002
8	10	11	2.509E+0004	9.986E+0003	3.260E+0002
9	9	11	2.461E+0004	9.986E+0003	3.260E+0002
10	8	11	2.411E+0004	9.986E+0003	3.270E+0002
11	7	10	2.360E+0004	9.750E+0003	3.270E+0002
12	5	8	2.259E+0004	9.008E+0003	3.270E+0002
13	4	6	2.208E+0004	7.996E+0003	3.270E+0002
14	3	4	2.161E+0004	6.984E+0003	3.270E+0002
15	2	2	2.111E+0004	6.006E+0003	3.280E+0002
16	17	17	2.809E+0004	1.299E+0004	3.250E+0002
17	18	17	2.859E+0004	1.299E+0004	3.240E+0002
18	19	18	2.910E+0004	1.349E+0004	3.240E+0002
19	19	19	2.910E+0004	1.400E+0004	3.240E+0002
20	20	19	2.961E+0004	1.400E+0004	3.240E+0002
21	21	20	3.011E+0004	1.451E+0004	3.240E+0002
22	21	21	3.011E+0004	1.501E+0004	3.230E+0002
23	22	21	3.058E+0004	1.501E+0004	3.230E+0002
24	23	21	3.109E+0004	1.501E+0004	3.230E+0002
25	24	22	3.160E+0004	1.548E+0004	3.230E+0002
26	24	23	3.160E+0004	1.599E+0004	3.220E+0002
27	25	23	3.210E+0004	1.599E+0004	3.220E+0002
28	26	24	3.261E+0004	1.650E+0004	3.210E+0002

29	27	24	3.311E+0004	1.650E+0004	3.200E+0002
30	27	25	3.311E+0004	1.700E+0004	3.180E+0002
31	36	20	3.760E+0004	1.451E+0004	3.100E+0002
32	36	22	3.760E+0004	1.548E+0004	3.090E+0002
33	36	18	3.760E+0004	1.349E+0004	3.100E+0002
34	36	16	3.760E+0004	1.252E+0004	3.110E+0002
35	36	15	3.760E+0004	1.201E+0004	3.110E+0002
36	36	14	3.760E+0004	1.150E+0004	3.120E+0002
37	36	12	3.760E+0004	1.049E+0004	3.140E+0002
38	36	9	3.760E+0004	9.514E+0003	3.160E+0002
39	36	7	3.760E+0004	8.502E+0003	3.180E+0002
40	36	5	3.760E+0004	7.490E+0003	3.200E+0002
41	36	3	3.760E+0004	6.512E+0003	3.220E+0002
42	36	1	3.760E+0004	5.500E+0003	3.240E+0002
43	36	24	3.760E+0004	1.650E+0004	3.080E+0002

***** SPECIFIED FLUX NODES *****

Number of flux nodes : 0

***** SURFACE WATER BODIES *****

Number of surface water body nodes : 0

***** AQUIFER PROPERTIES *****

Number of different material properties : 1

No.	Kxx [ft/d]	Kyy [ft/d]	Porosity [-]	
1	5.000E+0000	5.000E+0000	2.000E-0001	(default)

********** DISTRIBUTION OF AQUIFER MATERIAL PROPERTIES **********

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17	1	1	1	*	*	*	*	*	*	*	*	*	*	*	1	1	1
16	1	1	1	*	*	*	*	*	*	*	*	*	*	*	1	1	1
15	1	1	1	1	*	*	*	*	*	*	*	*	1	1	1	1	1
14	1	1	1	1	*	*	*	*	*	*	*	*	1	1	1	1	1
13	1	1	1	1	1	*	*	*	*	*	*	1	1	1	1	1	1
12	1	1	1	1	1	1	*	*	*	*	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

********** DISTRIBUTION OF AQUIFER MATERIAL PROPERTIES **********
(continued)

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
25	*	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1
24	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1
23	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	1
22	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	1
21	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

********** DISTRIBUTION OF AQUIFER MATERIAL PROPERTIES **********
(continued)

	35	36
25	1	1
24	1	1
23	1	1
22	1	1
21	1	1
20	1	1
19	1	1
18	1	1
17	1	1
16	1	1
15	1	1
14	1	1
13	1	1
12	1	1
11	1	1
10	1	1
9	1	1
8	1	1
7	1	1
6	1	1
5	1	1
4	1	1
3	1	1
2	1	1
1	1	1
	35	36

***** AQUIFER TYPE *****

Unconfined aquifer

***** AQUIFER BOTTOM ELEVATIONS *****

Number of different aquifer bottom elevations : 1

No.	aquifer bottom elevation [ft]
1	2.900E+0002 (default)

********** DISTRIBUTION OF AQUIFER BOTTOM ELEVATIONS **********

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17	1	1	1	*	*	*	*	*	*	*	*	*	*	*	1	1	1
16	1	1	1	*	*	*	*	*	*	*	*	*	*	*	1	1	1
15	1	1	1	1	*	*	*	*	*	*	*	*	1	1	1	1	1
14	1	1	1	1	*	*	*	*	*	*	*	*	1	1	1	1	1
13	1	1	1	1	1	*	*	*	*	*	*	1	1	1	1	1	1
12	1	1	1	1	1	1	*	*	*	*	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

********** DISTRIBUTION OF AQUIFER BOTTOM ELEVATIONS **********
(continued)

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
25	*	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	
24	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1	
23	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	
22	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	
21	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	
20	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	
19	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
18	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

********** DISTRIBUTION OF AQUIFER BOTTOM ELEVATIONS **********
(continued)

	35	36
25	1	1
24	1	1
23	1	1
22	1	1
21	1	1
20	1	1
19	1	1
18	1	1
17	1	1
16	1	1
15	1	1
14	1	1
13	1	1
12	1	1
11	1	1
10	1	1
9	1	1
8	1	1
7	1	1
6	1	1
5	1	1
4	1	1
3	1	1
2	1	1
1	1	1
	35	36

***** AREAL RECHARGE *****

Number of different infiltration/evapotranspiration rates : 1

No.	infiltration [L/T]	evapotranspiration [L/T]	effective recharge [L/T]	
1	0.000E+0000	0.000E+0000	0.000E+0000	(default)

********** DISTRIBUTION OF AREAL IN/OUT-FLUXES **********

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17	1	1	1	*	*	*	*	*	*	*	*	*	*	*	1	1	1
16	1	1	1	*	*	*	*	*	*	*	*	*	*	*	1	1	1
15	1	1	1	1	*	*	*	*	*	*	*	*	1	1	1	1	1
14	1	1	1	1	*	*	*	*	*	*	*	*	1	1	1	1	1
13	1	1	1	1	1	*	*	*	*	*	*	1	1	1	1	1	1
12	1	1	1	1	1	1	*	*	*	*	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

********** DISTRIBUTION OF AREAL IN/OUT-FLUXES **********
(continued)

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
25	*	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	
24	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1	
23	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	
22	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	
21	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	
20	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	
19	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
18	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

********** DISTRIBUTION OF AREAL IN/OUT-FLUXES **********
(continued)

	35	36
25	1	1
24	1	1
23	1	1
22	1	1
21	1	1
20	1	1
19	1	1
18	1	1
17	1	1
16	1	1
15	1	1
14	1	1
13	1	1
12	1	1
11	1	1
10	1	1
9	1	1
8	1	1
7	1	1
6	1	1
5	1	1
4	1	1
3	1	1
2	1	1
1	1	1
	35	36

***** PATHLINE & PARTICLE TRACKING DATA *****

Number of forward particles : 40

No.	x-release	y-release
1	3.011E+0004	1.026E+0004
2	3.011E+0004	1.056E+0004
3	2.994E+0004	1.042E+0004
4	2.822E+0004	9.952E+0003
5	2.829E+0004	9.851E+0003
6	2.826E+0004	9.683E+0003
7	2.839E+0004	1.083E+0004

8	2.849E+0004	1.093E+0004
9	2.843E+0004	1.113E+0004
10	2.660E+0004	1.050E+0004
11	2.660E+0004	1.099E+0004
12	2.660E+0004	1.001E+0004
13	2.660E+0004	9.516E+0003
14	2.709E+0004	9.745E+0003
15	2.709E+0004	1.001E+0004
16	2.709E+0004	1.050E+0004
17	2.709E+0004	1.099E+0004
18	2.709E+0004	1.151E+0004
19	2.759E+0004	1.151E+0004
20	2.759E+0004	1.200E+0004
21	2.785E+0004	1.200E+0004
22	2.811E+0004	1.200E+0004
23	2.811E+0004	1.151E+0004
24	2.811E+0004	1.050E+0004
25	2.785E+0004	1.050E+0004
26	2.759E+0004	1.050E+0004
27	2.759E+0004	1.102E+0004
28	2.759E+0004	1.001E+0004
29	2.785E+0004	1.001E+0004
30	2.811E+0004	1.001E+0004
31	2.811E+0004	9.745E+0003
32	2.808E+0004	9.516E+0003
33	2.759E+0004	9.516E+0003
34	2.860E+0004	1.050E+0004
35	2.860E+0004	1.099E+0004
36	2.860E+0004	1.151E+0004
37	2.909E+0004	1.099E+0004
38	2.909E+0004	1.050E+0004
39	2.909E+0004	1.001E+0004
40	2.860E+0004	1.001E+0004

Number of reverse particles : 0

Particles released at wells :

Well-No.	Particles released
1	0
2	0
3	0

********** HYDRAULIC HEAD DISTRIBUTION **********

	1	2	3	4	5	6
25	*	*	*	*	*	*
24	3.27E+0002	*	*	*	*	*
23	3.27E+0002	*	*	*	*	*
22	3.27E+0002	*	*	*	*	*
21	3.27E+0002	3.27E+0002	3.27E+0002	*	*	*
20	3.27E+0002	3.27E+0002	3.27E+0002	*	*	*
19	3.27E+0002	3.27E+0002	3.27E+0002	*	*	*
18	3.27E+0002	3.27E+0002	3.27E+0002	*	*	*
17	3.27E+0002	3.27E+0002	3.27E+0002	*	*	*
16	3.27E+0002	3.27E+0002	3.27E+0002	*	*	*
15	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	*	*
14	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	*	*
13	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	*
12	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002
11	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002
10	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002
9	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002
8	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002
7	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002
6	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002
5	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.26E+0002
4	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.26E+0002
3	3.28E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.26E+0002
2	3.28E+0002	3.28E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.26E+0002
1	3.28E+0002	3.28E+0002	3.27E+0002	3.27E+0002	3.27E+0002	3.26E+0002
	1	2	3	4	5	6

********** HYDRAULIC HEAD DISTRIBUTION **********
(continued)

	7	8	9	10	11	12
25	*	*	*	*	*	*
24	*	*	*	*	*	*
23	*	*	*	*	*	*
22	*	*	*	*	*	*
21	*	*	*	*	*	*
20	*	*	*	*	*	*
19	*	*	*	*	*	*
18	*	*	*	*	*	*
17	*	*	*	*	*	*
16	*	*	*	*	*	*
15	*	*	*	*	*	*
14	*	*	*	*	*	*
13	*	*	*	*	*	3.26E+0002
12	*	*	*	*	3.26E+0002	3.25E+0002
11	3.27E+0002	3.27E+0002	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002
10	3.27E+0002	3.27E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002
9	3.27E+0002	3.27E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002
8	3.27E+0002	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002
7	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002	3.25E+0002
6	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002	3.25E+0002
5	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002	3.25E+0002
4	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002	3.25E+0002
3	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002	3.24E+0002
2	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002	3.24E+0002
1	3.26E+0002	3.26E+0002	3.26E+0002	3.25E+0002	3.25E+0002	3.24E+0002
	7	8	9	10	11	12

********** HYDRAULIC HEAD DISTRIBUTION **********
(continued)

	13	14	15	16	17	18
25	*	*	*	*	*	*
24	*	*	*	*	*	*
23	*	*	*	*	*	*
22	*	*	*	*	*	*
21	*	*	*	*	*	*
20	*	*	*	*	*	*
19	*	*	*	*	*	*
18	*	*	*	*	*	*
17	*	*	3.25E+0002	3.25E+0002	3.25E+0002	3.24E+0002
16	*	*	3.25E+0002	3.25E+0002	3.24E+0002	3.24E+0002
15	3.25E+0002	3.25E+0002	3.24E+0002	3.24E+0002	3.24E+0002	3.23E+0002
14	3.25E+0002	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002
13	3.25E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.22E+0002	3.22E+0002
12	3.25E+0002	3.24E+0002	3.23E+0002	3.22E+0002	3.22E+0002	3.22E+0002
11	3.24E+0002	3.24E+0002	3.23E+0002	3.22E+0002	3.22E+0002	3.22E+0002
10	3.24E+0002	3.23E+0002	3.22E+0002	3.21E+0002	3.22E+0002	3.22E+0002
9	3.24E+0002	3.23E+0002	3.23E+0002	3.22E+0002	3.22E+0002	3.22E+0002
8	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.22E+0002	3.22E+0002
7	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002	3.22E+0002
6	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002	3.22E+0002
5	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002	3.23E+0002
4	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002	3.23E+0002
3	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002	3.23E+0002
2	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002	3.23E+0002
1	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.23E+0002	3.23E+0002
	13	14	15	16	17	18

********** HYDRAULIC HEAD DISTRIBUTION **********
(continued)

	19	20	21	22	23	24
25	*	*	*	*	*	*
24	*	*	*	*	*	*
23	*	*	*	*	*	3.22E+0002
22	*	*	*	*	*	3.23E+0002
21	*	*	3.23E+0002	3.23E+0002	3.23E+0002	3.22E+0002
20	*	*	3.24E+0002	3.23E+0002	3.23E+0002	3.22E+0002
19	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.22E+0002	3.22E+0002
18	3.24E+0002	3.24E+0002	3.23E+0002	3.23E+0002	3.22E+0002	3.21E+0002
17	3.24E+0002	3.23E+0002	3.23E+0002	3.22E+0002	3.22E+0002	3.21E+0002
16	3.23E+0002	3.23E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002
15	3.23E+0002	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002
14	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002
13	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002
12	3.21E+0002	3.20E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002
11	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002
10	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002
9	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002
8	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002
7	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.21E+0002
6	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002
5	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002
4	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002	3.21E+0002
3	3.22E+0002	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002
2	3.22E+0002	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002
1	3.22E+0002	3.22E+0002	3.22E+0002	3.22E+0002	3.21E+0002	3.21E+0002

	19	20	21	22	23	24

********** HYDRAULIC HEAD DISTRIBUTION **********
(continued)

	25	26	27	28	29	30
25	*	*	3.18E+0002	3.18E+0002	3.18E+0002	3.17E+0002
24	*	3.21E+0002	3.20E+0002	3.19E+0002	3.18E+0002	3.17E+0002
23	3.22E+0002	3.21E+0002	3.20E+0002	3.19E+0002	3.18E+0002	3.17E+0002
22	3.22E+0002	3.21E+0002	3.20E+0002	3.19E+0002	3.18E+0002	3.17E+0002
21	3.22E+0002	3.21E+0002	3.20E+0002	3.19E+0002	3.18E+0002	3.17E+0002
20	3.21E+0002	3.20E+0002	3.20E+0002	3.19E+0002	3.18E+0002	3.17E+0002
19	3.21E+0002	3.20E+0002	3.20E+0002	3.19E+0002	3.18E+0002	3.17E+0002
18	3.21E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.18E+0002	3.17E+0002
17	3.21E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.18E+0002	3.17E+0002
16	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.18E+0002	3.17E+0002
15	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.18E+0002	3.17E+0002
14	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.18E+0002	3.18E+0002
13	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.18E+0002	3.18E+0002
12	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.19E+0002	3.18E+0002
11	3.20E+0002	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.18E+0002
10	3.20E+0002	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.19E+0002
9	3.20E+0002	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002	3.19E+0002
8	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.19E+0002	3.19E+0002
7	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.19E+0002
6	3.21E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002
5	3.21E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002
4	3.21E+0002	3.21E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002
3	3.21E+0002	3.21E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002
2	3.21E+0002	3.21E+0002	3.21E+0002	3.20E+0002	3.20E+0002	3.20E+0002
1	3.21E+0002	3.21E+0002	3.21E+0002	3.20E+0002	3.20E+0002	3.20E+0002
	25	26	27	28	29	30

********** HYDRAULIC HEAD DISTRIBUTION **********
(continued)

	31	32	33	34	35	36
25	3.16E+0002	3.15E+0002	3.13E+0002	3.12E+0002	3.11E+0002	3.09E+0002
24	3.16E+0002	3.15E+0002	3.13E+0002	3.12E+0002	3.10E+0002	3.08E+0002
23	3.16E+0002	3.15E+0002	3.13E+0002	3.12E+0002	3.11E+0002	3.10E+0002
22	3.16E+0002	3.15E+0002	3.14E+0002	3.12E+0002	3.11E+0002	3.09E+0002
21	3.16E+0002	3.15E+0002	3.14E+0002	3.13E+0002	3.11E+0002	3.10E+0002
20	3.16E+0002	3.15E+0002	3.14E+0002	3.13E+0002	3.11E+0002	3.10E+0002
19	3.16E+0002	3.15E+0002	3.14E+0002	3.13E+0002	3.12E+0002	3.11E+0002
18	3.16E+0002	3.15E+0002	3.14E+0002	3.13E+0002	3.12E+0002	3.10E+0002
17	3.16E+0002	3.15E+0002	3.14E+0002	3.13E+0002	3.12E+0002	3.11E+0002
16	3.16E+0002	3.16E+0002	3.15E+0002	3.14E+0002	3.12E+0002	3.11E+0002
15	3.17E+0002	3.16E+0002	3.15E+0002	3.14E+0002	3.13E+0002	3.11E+0002
14	3.17E+0002	3.16E+0002	3.15E+0002	3.15E+0002	3.13E+0002	3.12E+0002
13	3.17E+0002	3.17E+0002	3.16E+0002	3.15E+0002	3.14E+0002	3.14E+0002
12	3.18E+0002	3.17E+0002	3.16E+0002	3.16E+0002	3.15E+0002	3.14E+0002
11	3.18E+0002	3.17E+0002	3.17E+0002	3.16E+0002	3.16E+0002	3.15E+0002
10	3.18E+0002	3.18E+0002	3.17E+0002	3.17E+0002	3.16E+0002	3.16E+0002
9	3.18E+0002	3.18E+0002	3.18E+0002	3.17E+0002	3.17E+0002	3.16E+0002
8	3.19E+0002	3.18E+0002	3.18E+0002	3.18E+0002	3.18E+0002	3.17E+0002
7	3.19E+0002	3.19E+0002	3.19E+0002	3.18E+0002	3.18E+0002	3.18E+0002
6	3.19E+0002	3.19E+0002	3.19E+0002	3.19E+0002	3.19E+0002	3.19E+0002
5	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002
4	3.20E+0002	3.20E+0002	3.20E+0002	3.20E+0002	3.21E+0002	3.21E+0002
3	3.20E+0002	3.20E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.22E+0002
2	3.20E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.22E+0002	3.22E+0002
1	3.20E+0002	3.21E+0002	3.21E+0002	3.21E+0002	3.22E+0002	3.24E+0002

	31	32	33	34	35	36

********** End of logbook **********

Appendix G

Front Royal

Environmental Services, Inc.

2200 Gateway Blvd. • Suite 205 • Morrisville, NC 27560
P.O. Box 4350 • Cary, NC 27519-4350
(919) 469-9795 • Fax (919) 469-3557

September 27, 1995

Mr. Phillip Orozco
North Carolina Department of Environment,
Health, and Natural Resources
Division of Environmental Management
Raleigh Regional Office
3800 Barrett Drive
Raleigh, North Carolina 27609

Re: Soil Land Application Permit
Teer Company Durham Quarry
Denfield Street
Durham, North Carolina
Front Royal Project No. 0013-94-012

Dear Mr. Orozco:

Front Royal Environmental Services, Inc. (Front Royal) on behalf of the Teer Company (Teer) is submitting this permit application, the soil remediation checklist and the application fee for the land application of soils containing petroleum fuel products at the Teer Company Durham Quarry site (Appendix A). The site is located at the end of Denfield Street in Durham County, North Carolina (36° 4' 12'' N latitude and 78° 53' 11'' W latitude) (Figure 1). The site covers approximately 340 acres and has been in operation as a crushed stone quarry and processing plant since the 1940's (Figure 2). The following summary details the site conditions and the required information for the land application permit.

1 Background Information

Approximately 200 cubic yards of contaminated soils were excavated from the site during the removal of several concrete pads that were located in the vicinity of an asphalt plant that was formerly in operation along the southern boundary of the quarry pit. The excavated soils were temporarily stockpiled onsite. Due to the small quantity of contaminated soils and because there is extensive unused land area within the Teer property boundaries, it was determined that land applying the contaminated soils on the Teer property is the most cost effective remedial alternative.

2 Laboratory Data

In July 1995, the stockpiled soils were sampled by Front Royal personnel according to NCDEM protocol. Two samples, each consisting of 6 composites, were collected from an

estimated rectangular stockpile with pointed crest. The samples were collected at depths between 2 and 4 feet. The samples were collected with a decontaminated hand auger. The primary samples were placed in clean glass jars, capped, and stored in a chilled environment. Due to the conditions, the primary samples were transported to an offsite area to be composited in a cool environment out of the direct sun. The primary samples were composited and immediately placed in clean glass jars, capped and stored in a chilled environment and transported under chain of custody to a certified laboratory.

The composite samples were analyzed for high and low boiling point fuels (EPA Methods 5030/3550), oil and grease (EPA Method 9071), and toxicity characteristic leaching procedure (TCLP) for organics and metals (EPA Method 1311) and volatiles and semi-volatiles (EPA Method 8240/8270). The laboratory data from composite A indicate that total petroleum hydrocarbons as diesel were detected at 149 milligrams per kilogram (mg/kg) and oil and grease were detected at 1,437 mg/kg (Appendix B). The volatiles and semi-volatiles were not detected above method detection limits. None of the TCLP metals were detected above EPA established maximum concentrations.

The laboratory analytical data from composite B indicate TPH as diesel at 1,040 mg/kg and oil and grease at 618 mg/kg (Appendix B). The volatiles and semi-volatiles were not detected above method detection limits and none of the TCLP metals were detected above EPA limits.

3 Soil Report

3.1 Geology

The Teer Durham quarry is located within the Durham Basin, the northernmost portion of the Deep River basin in the Piedmont Physiographic province of central North Carolina (Hoffman and Gallagher, 1989). This half-graben basin lies between the Western Slate Belt and the Raleigh Belt of the Piedmont. Surficial rocks within the quarry have been mapped as the late Triassic Age siltstones, sandstones, mudstones, shales and fanglomerates, belonging to the Sanford Formation of the Chatham Group (Hoffman and Gallagher, 1989). These sedimentary rocks are typically maroon, tan, red to reddish-brown. Abundant outcrops are evident in the quarry walls and areas stipped of overburden.

The site is located on a wide topographic terrace with elevations of 300 to 350 feet, with a high point of 397 feet mean sea level (msl) and a low point of 262 feet msl at the Eno River. Quarrying operations over the past 50 years have modified both the surface and subsurface soil structure. Man-placed crushed stone and asphalt pavement covers the outer rim of the quarry pit.

3.2 Soils

The soil that comprises the site has developed from the Triassic sedimentary rocks and is essentially a thin veneer over bedrock. Most of the soil solum consists of reddish-brown, micaceous silt, which has weathered from sedimentary rock. The Soil Conservation Service has mapped the area surrounding the quarry as Mayodan sandy loam, White Store sandy loam, or Iredell loam. Quarrying activities have greatly altered the soil structure to make it virtually impossible to assign a soil series classification.

Previous investigations performed by the Geonetics Corporation have compiled through a series of deep soil borings a fairly uniform soil structure of clayey silts overlain by a two to four foot thick veneer of crushed stone and fine to medium sands from the quarry operation. Depth to the shallow water table occurs at depths of approximately 4 to 10 feet. Auger refusal ranges from 10 feet to 20 feet below land surface (Appendix C). The shallow water table occurs at depths of approximately 4 to 10 feet.

3.3 Site Inspection

The application area was inspected by Front Royal personnel on Friday, March 17, 1995. A total of three hand borings were advanced at 100 foot intervals along the central axis of the application area. Auger refusal was encountered at -0.5 feet at each boring location. Samples were collected from each boring and the stockpiled soil, and were sent to an analytical laboratory to be tested for PH, Cation exchange capacity (CEC), base saturation as well as other parameters (Appendix D).

3.4 Results of Soil Investigation

Laboratory soil test results show that the soil Ph is 7.9 standard units across the proposed land application area. The pH for the soil sample collected from the stockpile was 7.6 standard units. This indicates that the soil will not have to be limed to increase the soil pH to the desirable range of 5.5 to 7.5 standard units. The Cation Exchange Capacity of the soil sample taken from the stockpile was 12.0 meq/100 cm^3. The CEC ranged from 5.9 to 16.1 meq/100 cm^3 across the application area. These values indicate an excellent range for the chosen cover crop growth rate, since the higher the CEC the easier the cover crop will be able to absorb applied nutrients throughout the growing season. Existing nitrogen, phosphorous and potassium soil levels will need to be enhanced with the application of 20 pounds of 5-10-10 fertilizer per 1000 square feet of application area (480 pounds), when the fescue cover crop is planted.

3.5 Conclusions

The proposed application area is an ideal site for the land application of the petroleum impacted soils. The soil CEC, Base Saturation and Ph are in the most desirable range for establishing a strong cover crop. The subsurface soils will help retard the movement of any contaminants toward the water table. The existing soil stockpile will be leveled out to a depth

of approximately 3 inches thick across the application area. Active microbial populations will be applied to the soil along with the recommended fertilizer amount and then disked into the native soil with a farm tractor pulling a double-row disk implement. This will enable the microbial populations to fully mix with the fertilizer, the applied soil and any existing native microbial populations. This treatment regime should hasten the treatment time of the petroleum impacted soils.

4 Land Application - Conventional Rate

As discussed above, Front Royal, on behalf of Teer, proposes to land apply approximately 200 cubic yards of contaminated soils onsite at a conventional rate. Calculations indicate that at the conventional application rate, a 0.5 acre application area is necessary (Appendix E). The contaminated soils will be land applied on a 150 foot by 150 foot area adjacent to the existing quarry at a depth of 3-inches (Figure 3). The soils will be incorporated into the native soils using a disk harrow and a tiller. Fertilizer will be added to the application area at a rate of 20 pounds of 5-10-10 fertilizer per 1000 square feet of application area. A fescue cover crop will be planted over the application area. K-31 Fescue will be broadcast seeded and covered with 30 bales of wheat straw to protect the fescue seed from temperature variations and aid in germination. The cover crop should be established in 10 - 14 days. In addition, a 2 to 3 foot woven, slit film, polypropylene silt fence will be constructed around the application area to provide runoff and erosion control. The application area will be examined on a weekly basis for moisture content and crop condition. The area will be watered as needed to maintain the cover crop.

Depth to ground water data indicate that there are two aquifers at the site. The depth to water in the shallow aquifer ranges from approximately 3.5 to 10 feet, however in the area of application, the depth to water increases as the aquifer slopes toward the east. The application area is located at the eastern boundary of the shallow aquifer. Monitor wells MW-12 and MW-18 are located in the vicinity of the application area, and historical ground water elevation data from these wells indicates that the depth to water in the application area is greater than four feet (Table 1).

There are no residences within 400 feet of the application area. The nearest residence is located off of the Teer property approximately 2,000 feet from the application area. There are no water supply wells within 500 feet of the application area. Three water supply wells are located on the Teer property, however, only one of the wells in use for truck washing purposes. The water supply well that is in use is located near the woods east of the paint shop approximately 900 feet from the application area. The other wells that are not in use are located adjacent to the paint shop and near the welding shop, approximately 800 feet and 1,000 feet from the application area, respectively.

5 Site Monitoring

Soil samples will be collected from the application area six months following the initial application date. The application area will be divided into nine 50 x 50 foot squares and one sample will be collected from each square. Samples will be analyzed for total petroleum hydrocarbons as diesel by EPA Methods 3550 and oil and grease by EPA Method 9071. If laboratory analytical data indicate that no contaminants are present after six months, an application for closure will be submitted. If contaminants are detected, the site will be retilled and fertilized as described above. Sampling will continue every six months until closure can be obtained.

If you have any questions regarding this matter or if you require any additional information, please contact us at (919) 469-9795.

Sincerely,

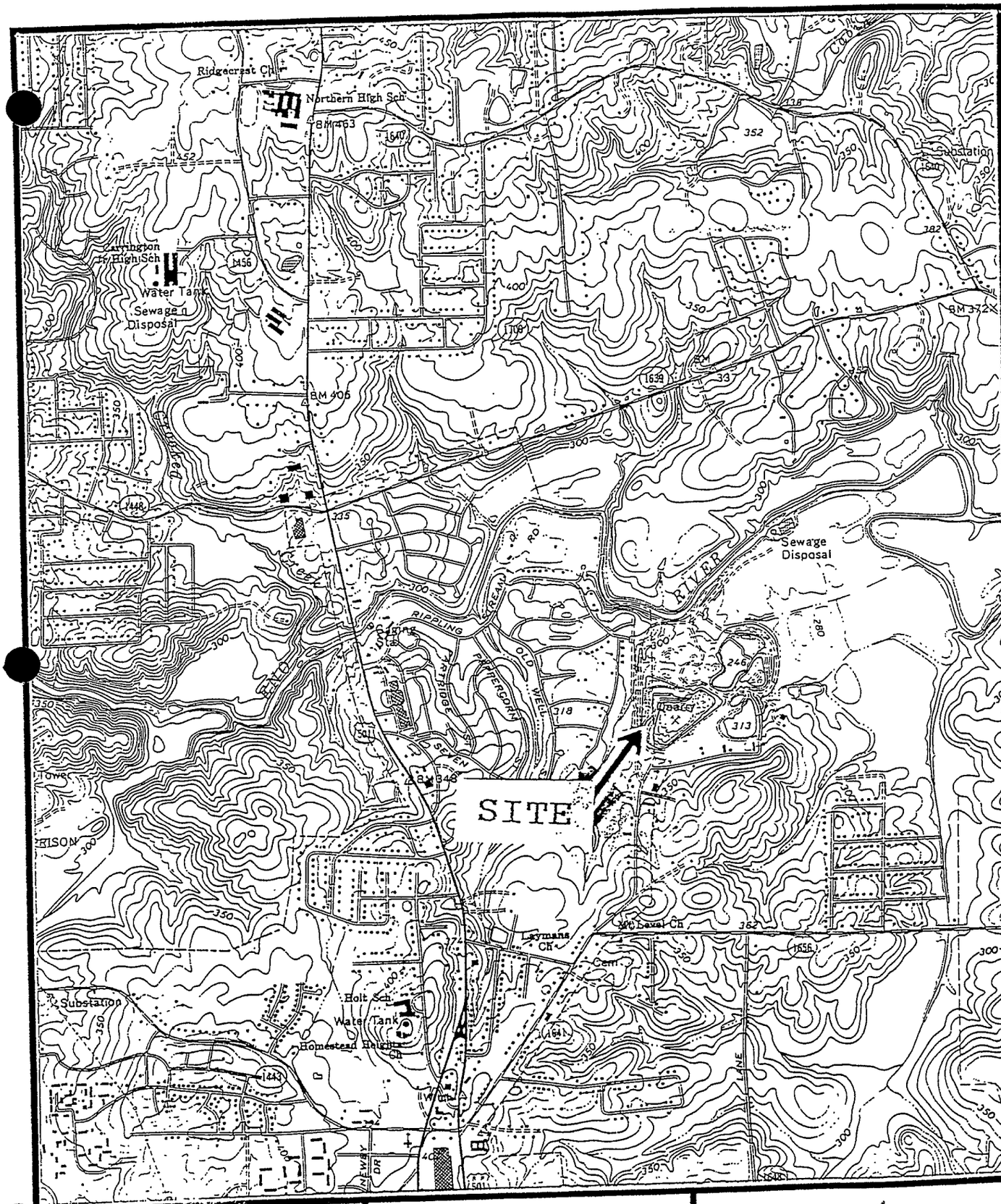
FRONT ROYAL ENVIRONMENTAL SERVICES, INC.

David E. Meyer
Senior Soil Scientist

Stephanie L. Freese, E.I.T.
Project Engineer

Bryan C. Gee, P.E.
Senior Project Manager

SLF:BCG:asb
Attachments



SITE LOCATION MAP

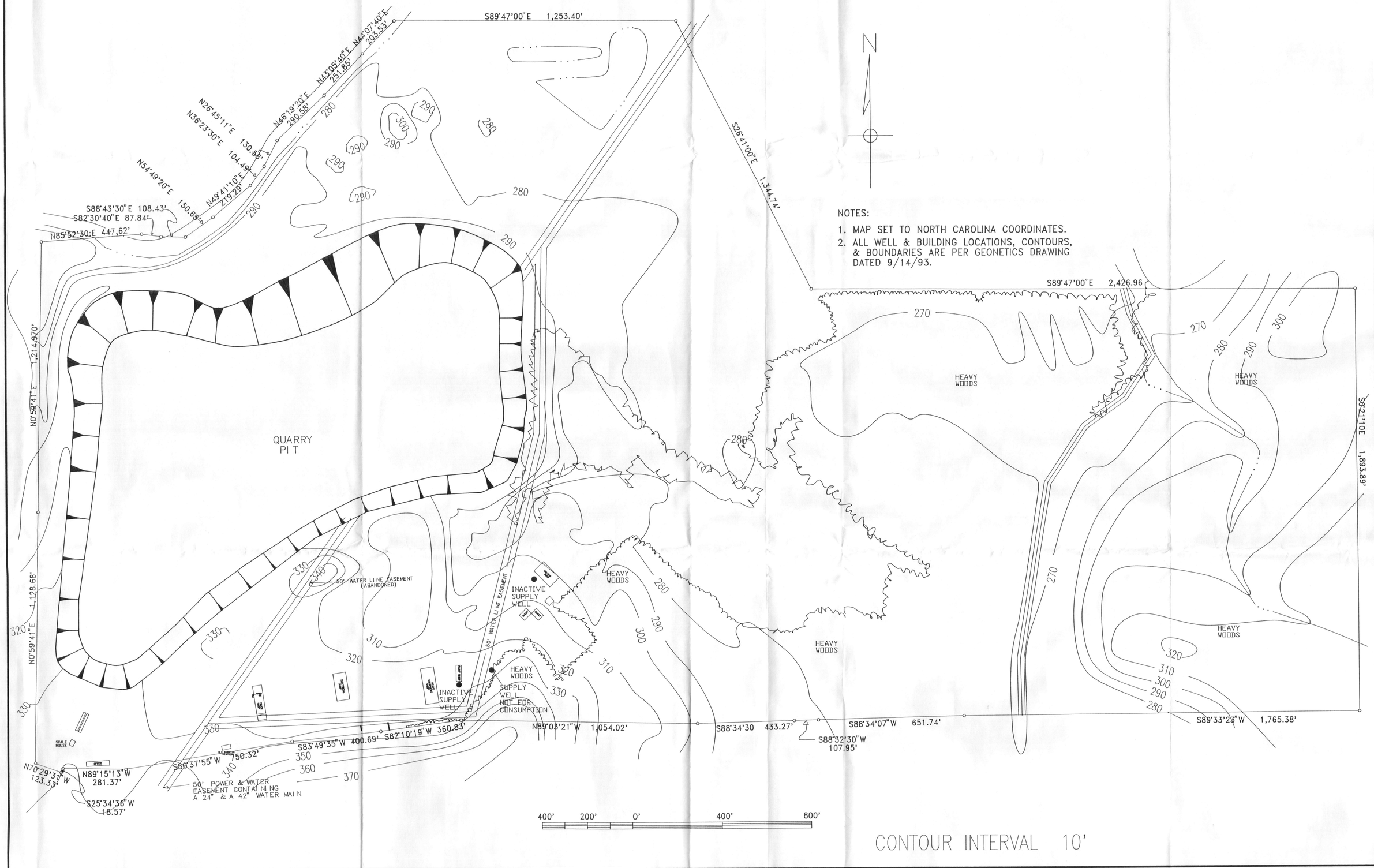
FRONT ROYAL

ENVIRONMENTAL SERVICES, INC.

FIGURE 1

SCALE: 1'' = 2,000'

PROJ. #0013-94-012



FRONT ROYAL

ENVIRONMENTAL SERVICES, INC.

MORRISVILLE, NORTH CAROLINA

Engineer's Seal

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NELLO L. TEER
DURHAM QUARRY

Revisions

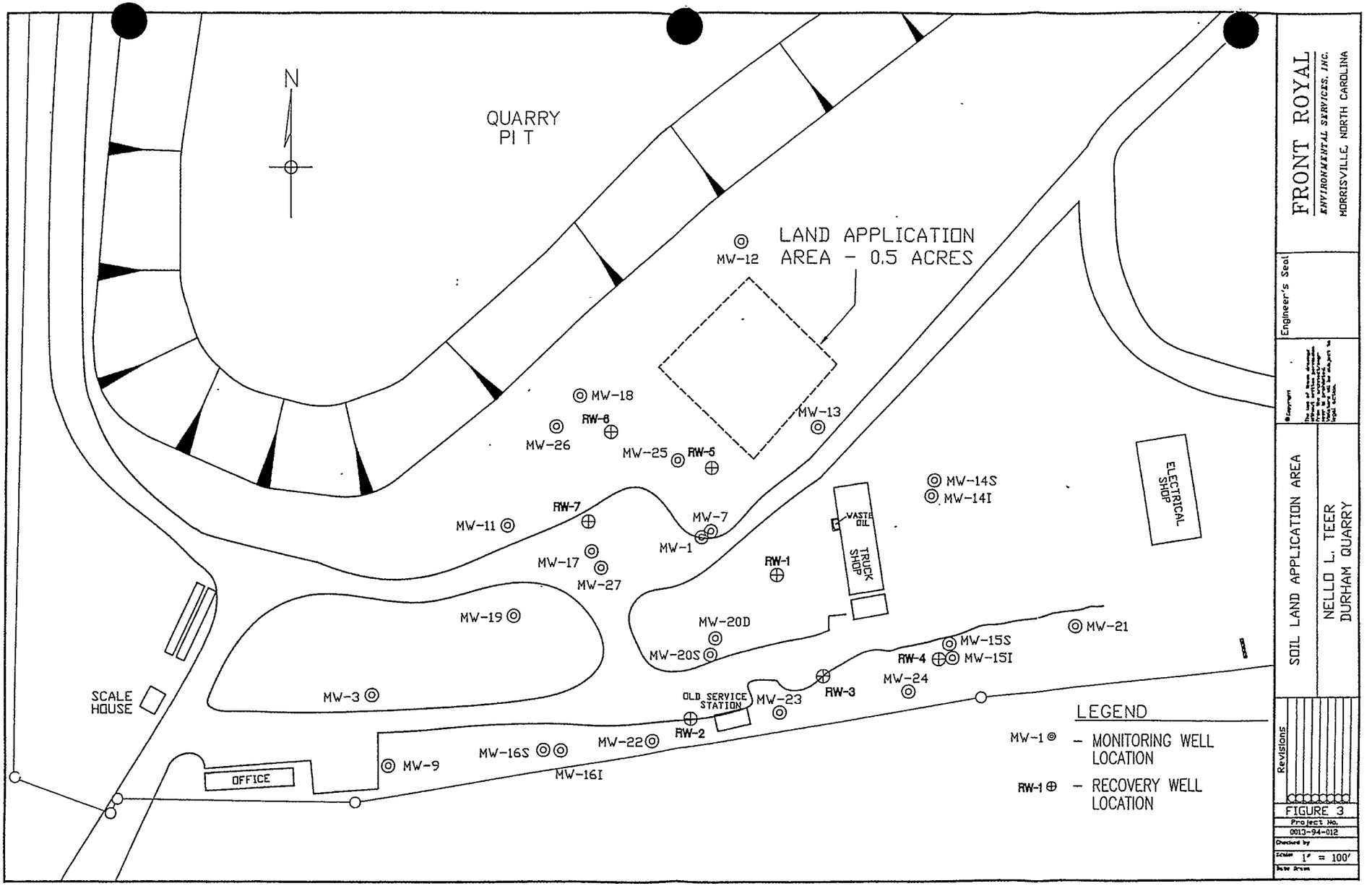
FIGURE 2

Project No.
0013-94-012

Checked by

Drawn by

Date Drawn



FRONT ROYAL
ENVIRONMENTAL SERVICES, INC.
MORRISVILLE, NORTH CAROLINA

Engineer's Seal

SOIL LAND APPLICATION AREA
NELLO L. TEER
DURHAM QUARRY

Revisions

FIGURE 3
Project No.
0013-94-012
Checked by
Scale 1" = 100'
Date Drawn

Table 1. Depth to Water Data

Well Number	Well Depth	Depth to Water From Top of Casing (feet) Date Collected August 1994	January 1995	April 1995
RW-2	51.4	23.22	NM	20.45
RW-3	94.8	20.65	NM	NM
RW-4	93.0	16.92	NM	NM
MW-1	37.9	37.90	NM	NM
MW-3	74.0	28.38	30.00	27.89
MW-7	17.3	10.62	11.23	10.79
MW-9	40.8	23.91	25.66	23.27
MW-11	50.8	35.27	36.06	35.53
MW-12	21.2	7.86	6.51	7.58
MW-13	66.3	23.15	24.27	23.60
MW-14S	20.4	14.16	14.84	13.41
MW-14I	49.8	15.64	18.85	22.94
MW-15S	17.5	6.61	3.60	4.32
MW-15I	40.8	17.18	17.44	15.99
MW-16S	11.9	9.32	11.24	10.21
MW-16I	60.2	23.50	24.58	22.71
MW-17	12.5	3.85	3.41	4.00
MW-18	14.3	4.80	4.32	4.95
MW-19	13.3	2.92	2.28	3.15
MW-20S	33.7	18.74	19.41	17.82
MW-20D	115.0	25.91	27.47	26.55
MW-21	70.0	16.57	16.95	15.63
MW-22	60.6	21.40	21.95	20.11
MW-23	60.5	20.61	21.20	19.62
MW-24	37.8	17.72	16.39	14.82
MW-25	14.5	5.23	5.02	5.35
MW-26	13.3	5.63	5.18	5.67
MW-27	21.5	3.48	NM	NM

NM - Not Measured

Front Royal Project 0013-94-012
soilper1.wk4

Appendix A

Permit Application and Remediation Checklist

North Carolina Department of Environment, Health, and Natural Resources
Environmental Management Commission

DEM USE ONLY
PERMIT NO: SR

Permit Application For The Land Application or Containment and Treatment of Soils Containing Petroleum Fuel Products

Note: Processing of this application will not begin until three (3) copies of this application form and three (3) copies of all of the following information and documents, and the $400.00 non-refundable permit application processing fee **(Make checks/M.O. Payable to: N.C. Dept. EHNR)**, have been submitted. If any of the required items have been excluded from the package, please explain.

SUBMIT COMPLETED APPLICATION TO: Raleigh REGIONAL OFFICE,
ATTN. REGIONAL SUPERVISOR
(For Appropriate Regional Office, See Map on Reverse of Pink Copy)

Applicant (Name of corporation, company, individual or other): Nello Teer Company

Applicant Mailing Address: Post Office Box 13983, Research Triangle Park, NC 27709-3983
Zip Code

Steven S. Edgerton, Environmental Manager (919) 380-2519
Contact Person Telephone No.

Section A: GENERAL INFORMATION

1. LOCATION of source of contaminated soil: Nello Teer Durham Quarry
5013 Denfield Road (State Road 1641), Durham, NC 27704
County: Durham

2. PRODUCT RELEASED: Indicate Specific Type (see below): Class I and Class II
Class I Products: Motor gasoline, Aviation Gasoline, Gasohol, Some Military Jet Fuels (JP-4, Jet-A).
Class II Products: All other Jet Fuels, Kerosene, Diesel Fuel, Fuel Oils (Nos. 1-6), Motor Oils (new or used).

3. SOURCE(S) OF PETROLEUM RELEASED (Check all that apply)
- [XX] Underground Storage Tank **(Indicate Tank Facility I.D. # (if known):** _____ **)**
- [XX] Aboveground Storage Tank above ground waste oil tank
- [ ] Spill From Tanker Truck or Other Carrier
- [ ] Other (specify) _____

4. If source(s) of petroleum released includes Underground Storage Tank, provide tank owner's name, mailing address and telephone number.
- [XX] **Check here, if same as applicant**

Name: _____
Address: _____
Telephone Number: _____

5. Provide the name, mailing address and telephone number of the owner of the property on which the petroleum release occurred.
- [XX] **Check here, if same as applicant**

Name: _____
Address: _____
Telephone Number: _____

6. Volume of product released (if known): _____ gallons.

7. Volume of contaminated soil (estimate): 200 cubic yards.

8. Date soil was excavated: see attached sheet

Section B: DESIGN INFORMATION (Check Only One)

1- [ ] Land Application - (Minimum Rate: One Time Application)
2- [XX] Land Application - (Conventional Rate: One Time Application)
3- [ ] Containment and Treatment or Treatment/Utilization at a Production Facility

SEE ATTACHMENT I (Form GW-70A) GUIDANCE ON COMPLETING THIS SECTION.

Steven S. Edgerton
Signature of Applicant

Permit Application for the Land Application of Soils Containing Petroleum Fuel Products

8. Contaminated soils were excavated during onsite assessment activities in January and July 1995.

SOIL REMEDIATION CHECKLIST
based on February 1, 1993
2H.0205(d)(12), 2H.0219(j) and 2H.0219(m)
This checklist should be followed in addition to the requirements in Groundwater Section Guidlines for the Investigation and Remediation of Soils and Groundwater.

ALL PERMITS MUST HAVE

COMPLETE CHEMICAL ANALYSIS OF THE CONTAMINATED SOIL:

x TPH
x Semi volatiles and volatile hydrocarbons
x pH
x heavy metal (total)
x TCLP unless:
virgin source of contaminants
concentration < regulatory level of petroleum product
if soil is contaminated w/ used motor oil
waste oil
non regulated pet. product

SCALED MAP

x 1 inch = 100 feet
or topo interval < or = to 10 feet or 25% of total site relief.
x property boundaries (50 foot buffer)
x structures within 400 feet of site
x storage and application site
x location of all wells within 500 feet
x surface drainage features
x any residence within 400 feet of site

N/A EROSION CONTROL PLAN
for sites > 1 acre
x COVER CROP INDICATION
x VOLUME OF SOIL TO BE REMEDIATED
N/A LAND OWNERS AGREEMENT
x DEPTH TO SEASONAL HIGH WATER TABLE WITH SUBSTANTIAL PROOF

MINIMUM RATE PERMITS MUST HAVE: N/A

___ CALCULATION OF AREA REQUIRED (using 1" thickness)
___ INDICATION OF A COVER CROP
MINIMUM DESIGN REQUIREMENTS (2H.0219 (m))
_____ incorporation into the native site upon application
_____ (optional)liming fertilization and areation of soil

CONVENTIONAL RATE PEMITS MUST HAVE:

__X__ SOIL EVALUATION REPORT (to a depth of 5 feet)

- __x__ texture
- __x__ color
- __x__ structure
- __x__ depth of horizons and thickness
- __x__ presence of any restrictive horizon
- __x__ depth to seasonal high water table
- __x__ pH
- __x__ Cation Exchange Capacity
- __x__ estimation of liming and fert requirements

0.5acre CALCULATION OF AREA REQUIRED

3inches thickness of application

__x__ INDICATION OF A COVER CROP

__x__ SITE MAINTENANCE PLAN

- __x__ fertilization, liming and areation

__x__ MONITORING WELL NETWORK (dedicated sites only)

Quarterly sampling program in place to monitor ground water contamination.

BIOREMEDIATION AND VOLATILIZATION ON IMPERMEABLE SURFACE N/A

PERMITS MUST HAVE:

_____ SOIL EVALUATION REPORT (to a depth of 5 feet)

- _____ texture
- _____ color
- _____ structure
- _____ depth of horizons and thickness
- _____ presence of any restrictive horizon
- _____ depth to seasonal high water table
- _____ pH
- _____ CEC
- _____ estimation of liming and fert requirements

_____ PLANS AND SPECS

- _____ contaminant vessel
- _____ leachate collection system
- _____ operating thickness of soil to be contained

_____ CHEMICAL/BIOLOGICAL ADDITIVES

ALL PERMITS SHOUL MEET THE FOLLOWING BUFFERS (2H.0219(j)(5))

100 feet between disposal area and:

Dwellings

N/A Any habitable residence or place of public assembly under seperate ownership or which is to be sold.

Water Sources

x Any private or public water supply source

x Any stream classified as WS or B
(Class WS I-V are protected water supplies.
I are essentially undeveloped watersheds
II predominately undeveloped
III low to moderately developed
IV moderately developed
V are watersheds upstream, draining to IV)
(Class B are freshwaters protected for recreation including swimming on a frequent basis and all class C waters

N/A Any stream classified as SA or SB
(Class SA are tidal saltwaters suitable for commercial shell fishing)
(Class SB are tidal saltwaters protected for primary recreation and all class SC uses (secondary uses)

x Any other stream, canal, marsh or coastal waters

N/A Any Class I or Class II impounded resevoir used as a source of drinking water

x Any other lake or impoundment

N/A Any swimming pool

x Any well with the exception of an approved groundwater monitoring well

50 feet from disposal area and:

x Any property line

x Any Public right of way surface disposal

25 feet from disposal area and:

x DOWNSLOPE Interceptor drains and surface water diversions

x Groundwater lowering and surface drainage ditches

20 feet from disposal area and:

N/A Any other nitrification area

15 feet from disposal area and:

x Any building foundation except treatment facilities

N/A Any basement

10 feet from disposal area and:

x Any water line from a disposal system

x UPSLOPE Ditches, drains, surface water diversions or other drainage systems

CONTAIN AND UTILIZE

N/A SITE MANAGEMENT PLAN

description of all operational proceedures

N/A description of staging area for initial reciepts

_____ method of emplacement of soils in containment

_____ average residence time in containment area

_____ method of incorporation of soil into production facility's product materials

_____ method of containment and disposal of any leachate or runoff from containment area

N/A MINIMUM DESIGN REQUIREMENTS (2H.0219 (m))

containment structure

_____ sythetic liner > or = to 30 mils or

_____ natural material 1 foot thick compacted to 95% standard proctor dry density permeability < 1 x 10^{-7} cm/sec

_____ bottom of stucture > or = 3 feet above seasonal high water table or bedrock

leachate collection system

_____ designed to prevent runoff or to advoid accumulation of stormwater within structure

H Y D R O L O G I C , I N C .

July 27, 1995

REPORTING:

HydroLogic-Morris., Inc.
2500 Gateway Centre
Suite #900
Morrisville, NC 27560

Attention: Pomeroy Smith

INVOICING:

HydroLogic-Morris., Inc.
2500 Gateway Centre
Suite #900
Morrisville, NC 27560

PROJECT NUMBER: FL9512070

DATE COMPLETED: July 27, 1995
DATE RECEIVED: July 18, 1995

PROJECT DESCRIPTION:

Front Royal Env./#0013-94-016--1 soil sample analyzed for 3550/5030/9071/TCLP(8240/8270).

Enclosed is the laboratory report for the project described above. If you have any questions or if we can be of further assistance, please feel free to contact Jamie Fore. We appreciate your business and look forward to serving you again soon.

Respectfully,

Benjamin Carl Esterle
Benjamin Carl Esterle
Laboratory Director

Post-it® Fax Note 7671	Date 7-28	# of pages ▶ 7
To Stephanie	From Lisa	
Co./Dept. Front Royal	Co.	
Phone #	Phone #	
Fax #	Fax #	

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070
HYDROLOGIC SAMPLE NUMBER: 9512070
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95
DATE EXTRACTED: 7/20/95
DATE/TIME ANALYZED: 7/25/95 7/25/95

METHOD TPH 3550/5030

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Diesel		2.1	149
Gasoline		2.0	BDL

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: DIESEL: DILUTION FACTOR X 2

H Y D R O L O G I C , I N C .

COMPANY NAME: Hydrologic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070
HYDROLOGIC SAMPLE NUMBER: 9512070
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95
DATE EXTRACTED: 7/18/95
DATE/TIME ANALYZED: 7/26/95

METHOD TCLP 8240

ANALYSIS	CAS NO.	SDL (mg/L)	RESULT (mg/L)
Benzene	71-43-2	0.001	BDL
Carbon Tetrachloride	56-23-5	0.001	BDL
Chlorobenzene	108-90-7	0.001	BDL
Chloroform	67-66-3	0.001	BDL
1,4-Dichlorobenzene	106-46-7	0.001	BDL
1,2-Dichloroethane	107-06-2	0.001	BDL
1,1-Dichloroethene	75-35-4	0.001	BDL
2-Butanone	78-93-3	0.100	BDL
Tetrachloroethene	127-18-4	0.001	BDL
Trichloroethene	79-01-6	0.001	BDL
Vinyl Chloride	75-01-4	0.005	BDL
			BDL
Surrogate Recoveries:			
1,2-Dichloroethane-D4			96%
Toluene-D8			114%
Bromofluorobenzene			120%

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070
HYDROLOGIC SAMPLE NUMBER: 9512070
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95
DATE EXTRACTED: 7/18/95
DATE/TIME ANALYZED: 7/25/95

METHOD TCLP 8270

ANALYSIS	CAS NO.	SDL (mg/l)	RESULT (mg/l)
1,4-Dichlorobenzene	106-46-7	0.05	BDL
2-Methylphenol	95-48-7	0.05	BDL
3-Methylphenol	108-39-4	0.05	BDL
4-Methylphenol	106-44-5	0.05	BDL
Hexachloroethane	67-72-1	0.05	BDL
Nitrobenzene	98-95-3	0.05	BDL
Hexachlorobutadiene	87-68-3	0.05	BDL
2,4,6-Trichlorophenol	88-06-2	0.05	BDL
2,4,5-Trichlorophenol	95-95-4	0.05	BDL
2,4-Dinitrotoluene	121-14-2	0.05	BDL
Hexachlorobenzene	118-74-1	0.05	BDL
Pentachlorophenol	87-86-5	0.05	BDL
Pyridine	110-86-1	0.25	BDL
Surrogate Recoveries:			
2-Fluorophenol			98%
Phenol-D6			82%
Nitrobenzene-D5			96%
2-Fluorobiphenyl			96%
2,4,6-Tribromophenol			60%
Terphenyl-D14			108%

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070
HYDROLOGIC SAMPLE NUMBER: 9512070
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95

ANALYSIS	DATE/TIME ANALYZED	METHOD	UNITS	SDL	RESULT
Oil and Grease	7/20/95	TPH 9071	mg/kg	10	1437

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

1491 Twilight Trail ☐ Frankfort, KY 40601 ☐ 502/223-0251 ☐ FAX 502/875-8016 ☐ Toll Free 1-800/728-2251

Subcontractor: ALI-KY
Contact Name: Ben
Date Shipped: 7/17/95
Comments:

SUBCONTRACT COC

Client Name: Front Royal
Project Number: 952646
Project: 0013-94-016
P.O. #: 41986

Report/Invoice To:
HydroLogic, Inc.
2500 Gateway Centre
Suite 900
Morrisville, NC 27
919-380-9699
800-241-4174
919-380-9717 (Fax)

JUL-28-1995 10:49

HYDROLOGIC-MURRISVILLE

ONE SAMPLE PER LINE

SAMPLE TYPE

SAMPLE #	SAMPLE MATRIX	COMP	GRAB	DATE	TIME	GW	DW	WW	SLD	OTHER	ANALYSIS & METHOD
COMPA	SOIL										5030,3550, 9071, 1311 TC

RELINQUISHED BY: Magalen Barbour 7/17/95 @ 1800
RECEIVED BY: DATE/TIME:
RELINQUISHED BY:
RECEIVED BY: J Rumer DATE/TIME: 7/18/95 11:20
METHOD OF SHIPMENT:

CHAIN OF CUSTODY

REPORT TO:
FRONT ROYAL ENV. SVCS
ATTN. BRYAN

HydroLogic, Inc.
2500 Gateway Centre Blvd., Suite 900
Morrisville, NC 27560
800-241-4174
919-380-9699

PO # 41986

Method of Shipment:

952646

PAGE ____ OF ____

CLIENT: NELCO TEER DURHAM QUARRY
PHONE: 469-9795
PROJ #: 0013-94-012 PO #: 41986
SAMPLER: SLF / BCG

PROJECT ID #:
REPORT DUE:
VERBAL FAX COPY HARD COPY

ANALYSES

FIELD ID	SAMPLE MATRIX	TIME COLLECTED	DATE COLLECTED	5030	3550	9071	1311 TCLP TOTAL ORGANICS and Metals						REMARKS
COMP A	SOIL	11:00 am	7-17-95	✓	✓	✓	✓						

RELINQUISHED BY: J. Freeze	DATE / TIME: 7/17/95 1:15	RECEIVED BY: Magalene Barbour	DATE / TIME: 7/17/95 1:1
RELINQUISHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:
RELINQUISHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:
DISPATCHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:

H Y D R O L O G I C , I N C .

July 25, 1995

REPORTING:

HydroLogic-Morris., Inc.
2500 Gateway Centre
Suite #900
Morrisville, NC 27560

Attention: Pomeroy Smith

INVOICING:

HydroLogic-Morris., Inc.
2500 Gateway Centre
Suite #900
Morrisville, NC 27560

PROJECT NUMBER: FL95120708

DATE COMPLETED: July 25, 1995
DATE RECEIVED: July 18, 1995

PROJECT DESCRIPTION:

Front Royal Env./#0013-94-016--1 soil sample analyzed for 8240/8270.

Enclosed is the laboratory report for the project described above. If you have any questions or if we can be of further assistance, please feel free to contact Jamie Fore. We appreciate your business and look forward to serving you again soon.

Respectfully,

Benjamin Carl Esterle
Laboratory Director

Post-it® Fax Note 7671 | Date 7/25 | # of pages ▶ 10
To Bryan | From Christina
Co./Dept. Front Royal | Co.
Phone # | Phone #
Fax # | Fax #

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#0013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070B
HYDROLOGIC SAMPLE NUMBER: 9512070B
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95
DATE EXTRACTED: N/A
DATE/TIME ANALYZED: 7/21/95

METHOD SW 846 8240

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Acetone	67-64-1	0.200	BDL
Acrolein	107-02-8	0.050	BDL
Acrylonitrile	107-13-1	0.050	BDL
Benzene	71-43-2	0.005	BDL
Bromodichloromethane	75-27-4	0.005	BDL
Bromoform	75-25-2	0.005	BDL
Bromomethane	74-83-9	0.01	BDL
2-Butanone	78-93-3	0.100	BDL
Carbon Disulfide	75-15-0	0.005	BDL
Carbon Tetrachloride	56-23-5	0.005	BDL
Chlorobenzene	108-90-7	0.005	BDL
Chloroethane	75-00-3	0.01	BDL
2-Chloro Ethyl Vinyl Ether	110-75-8	0.01	BDL
Chloroform	67-66-3	0.005	BDL
Chloromethane	74-87-3	0.01	BDL
Dibromochloromethane	124-48-1	0.005	BDL
Dibromomethane	74-95-3	0.005	BDL
1,4-Dichloro-2-Butane		0.005	BDL
Dichlorodifluoromethane	75-71-8	0.01	BDL
1,2-Dichlorobenzene	95-50-1	0.005	BDL
1,3-Dichlorobenzene	541-73-1	0.005	BDL
1,4-Dichlorobenzene	106-46-7	0.005	BDL
1,1-Dichloroethane	75-34-3	0.005	BDL
1,2-Dichloroethane	107-06-2	0.005	BDL
1,1-Dichloroethene	75-35-4	0.005	BDL

JUL-25-1995 16:14 HYDROLOGIC-MORRISVILLE 919 380 9717 P.02/10

H Y D R O L O G I C , I N C .

Page 2 continued

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#0013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070B
HYDROLOGIC SAMPLE NUMBER: 9512070B
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95

METHOD SW 846 8240

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
trans-1,2-Dichloroethene	156-60-5	0.005	BDL
1,2-Dichloropropane	78-87-5	0.005	BDL
cis-1,3-Dichloropropene	10061-01-5	0.005	BDL
trans-1,3-Dichloropropene	10061-02-6	0.005	BDL
Ethanol	64-17-5	0.100	BDL
Ethylbenzene	100-41-4	0.005	BDL
Ethyl Methacrylate	97-63-2	0.01	BDL
2-Hexanone	591-78-6	0.050	BDL
Iodomethane	74-88-4	0.01	BDL
Methylene Chloride	75-09-2	0.005	BDL
4-Methyl-2-Pentanone	108-10-1	0.050	BDL
Styrene	100-42-5	0.01	BDL
1,1,2,2-Tetrachloroethane	79-34-5	0.01	BDL
Tetrachloroethylene	127-18-4	0.01	BDL
Toluene	108-88-3	0.005	BDL
1,1,1-Trichloroethane	71-55-6	0.005	BDL
1,1,2-Trichloroethane	79-00-5	0.005	BDL
Trichloroethylene	79-01-6	0.005	BDL
Trichlorofluoromethane	75-69-4	0.005	BDL
Vinyl Chloride	75-01-4	0.01	BDL
Xylene (Total)	1330-20-7	0.005	BDL
Surrogate Recoveries:			
1,2-Dichloroethane-D4			90%
Toluene-D8			112%
Bromofluorobenzene			100%

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

JUL-25-1995 16:14 HYDROLOGIC-MORRISVILLE 919 380 9717 P.03/10

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#0013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070B
HYDROLOGIC SAMPLE NUMBER: 9512070B
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95
DATE EXTRACTED: 7/20/95
DATE/TIME ANALYZED: 7/20/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Acenaphthene	83-32-9	3.0	BDL
Acenaphthylene	208-96-8	3.0	BDL
Aniline	62-53-3	3.0	BDL
Anthracene	120-12-7	3.0	BDL
Benzidine	92-87-5	3.0	BDL
Benzoic Acid	65-85-0	16.5	BDL
Benzo(a)Anthracene	56-55-3	3.0	BDL
Benzo(b)Fluoranthene	205-99-2	3.0	BDL
Benzo(k)Fluoranthene	207-08-9	3.0	BDL
Benzo(g,h,i)Perylene	191-24-2	3.0	BDL
Benzo(a)Pyrene	50-32-8	3.0	BDL
Benzyl Alcohol	100-51-6	6.5	BDL
Bis(2-Chloroethoxy)Methane	111-91-1	3.0	BDL
Bis(2-Chloroethyl)Ether	111-44-4	3.0	BDL
Bis(2-Chloroisopropyl)Ether	39638-32-9	3.0	BDL
Bis(2-Ethylhexyl)Phthalate	117-81-7	3.0	BDL
4-Bromophenyl Phenyl Ether	101-55-3	3.0	BDL
Butyl Benzyl Phthalate	85-68-7	3.0	BDL
4-Chloroaniline	106-47-8	6.5	BDL
1-Chloronaphthalene		3.0	BDL
2-Chloronaphthalene	91-58-7	3.0	BDL
4-Chloro-3-Methyl Phenol	59-50-7	6.5	BDL
2-Chlorophenol	95-57-8	3.0	BDL
4-Chlorophenyl Phenyl Ether	7005-72-3	3.0	BDL
Chrysene	218-01-9	3.0	BDL

JUL-25-1995 16:15 HYDROLOGIC-MORRISVILLE 919 380 9717 P.04/10

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#0013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070B
HYDROLOGIC SAMPLE NUMBER: 9512070B
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Dibenz(a,h)Anthracene	53-70-3	3.0	BDL
Dibenzofuran	132-64-9	3.0	BDL
Di-N-Butylphthalate	84-74-2	3.0	BDL
1,3-Dichlorobenzene	541-73-1	3.0	BDL
1,4-Dichlorobenzene	106-46-7	3.0	BDL
1,2-Dichlorobenzene	95-50-1	3.0	BDL
3,3'-Dichlorobenzidine	91-94-1	6.5	BDL
2,4-Dichlorophenol	120-83-2	3.0	BDL
2,6-Dichlorophenol	87-65-0	3.0	BDL
Diethylphthalate	84-66-2	3.0	BDL
A,A-Dimethylphenethylamine	122-09-8	3.0	BDL
2,4-Dimethylphenol	105-67-9	3.0	BDL
Dimethylphthalate	131-11-3	3.0	BDL
4,6-Dinitro-2-Methylphenol	534-52-1	16.5	BDL
2,4-Dinitrophenol	51-28-5	26.5	BDL
2,4-Dinitrotoluene	121-14-2	3.0	BDL
2,6-Dinitrotoluene	606-20-2	3.0	BDL
Diphenylamine	122-39-4	3.0	BDL
Di-N-Octylphthalate	117-84-0	3.0	BDL
Fluoranthene	206-44-0	3.0	BDL
Fluorene	86-73-7	3.0	BDL
Hexachlorobenzene	118-74-1	3.0	BDL
Hexachlorobutadiene	87-68-3	3.0	BDL
Hexachlorocyclopentadiene	77-47-4	3.0	BDL

JUL-25-1995 16:15 HYDROLOGIC-MORRISVILLE 919 380 9717 P.05/10

HYDROLOGIC, INC.

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#0013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070B
HYDROLOGIC SAMPLE NUMBER: 9512070B
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Hexachloroethane	67-72-1	3.0	BDL
Indeno(1,2,3-cd)Pyrene	193-39-5	3.0	BDL
Isophorone	78-59-1	3.0	BDL
2-Methylnaphthalene	91-57-6	3.0	BDL
2-Methylphenol	95-48-7	3.0	BDL
4-Methylphenol	106-44-5	3.0	BDL
Naphthalene	91-20-3	3.0	BDL
2-Nitroaniline	88-74-4	16.5	BDL
3-Nitroaniline	99-09-2	16.5	BDL
4-Nitroaniline	100-01-6	16.5	BDL
Nitrobenzene	98-95-3	3.0	BDL
2-Nitrophenol	88-75-5	3.0	BDL
4-Nitrophenol	100-02-7	16.5	BDL
N-Nitroso-Di-N-Butylamine	924-16-3	3.0	BDL
N-Nitrosodimethylamine	62-75-9	3.0	BDL
N-Nitrosodiphenylamine	86-30-6	3.0	BDL
N-Nitrosodipropylamine	621-64-7	3.0	BDL
Pentachlorophenol	87-86-5	16.5	BDL
Phenanthrene	85-01-8	3.0	BDL
Phenol	108-95-2	3.0	BDL
Pyrene	129-00-0	3.0	BDL
1,2,4,5-Tetrachlorobenzene	95-94-3	3.0	BDL
2,3,4,6-Tetrachlorophenol	58-90-2	3.0	BDL
1,2,4-Trichlorobenzene	120-82-1	3.0	BDL

HYDROLOGIC-MORRISVILLE JUL-25-1995 16:15

H Y D R O L O G I C , I N C .

Page 4 continued

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL ENV./#0013-94-016

HYDROLOGIC PROJECT NUMBER: FL9512070B
HYDROLOGIC SAMPLE NUMBER: 9512070B
SAMPLE IDENTIFICATION: COMP A
DATE SAMPLED: 7/17/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
2,4,5-Trichlorophenol	95-95-4	3.0	BDL
2,4,6-Trichlorophenol	88-06-2	3.0	BDL
Surrogate Recovery:			
2-Fluorobiphenyl			85%
Nitrobenzene-d5			65%
4-Terphenyl-D14			86%
2-Fluorophenol			102%
Phenol-D5			103%
2,4,6-Tribromophenol			109%

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

H Y D R O L O G I C , I N C .

FINAL REPORT OF ANALYSES

HydroLogic, Inc. (MORRISVILLE)
2500 Gateway Centre
Suite 900
Morrisville, NC 27560-
Attn: Pomeroy Smith

REPORT DATE: 07/25/95

SAMPLE NUMBER- 9166 SAMPLE ID- ID# COMP A
DATE SAMPLED- 07/17/95
DATE RECEIVED- 07/18/95 SAMPLER- CLIENT
TIME RECEIVED- 0840 DELIVERED BY- FEDX

SAMPLE MATRIX- SO
TIME SAMPLED- 1100
RECEIVED BY- KAB

Page 1 of 1

ANALYSIS	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
ARSENIC, SOLID	3050/7061	07/20/95	AKW	07/20/95	ATR	2.4	mg/kg	1.0
BARIUM, SOLID	3050/7080	07/20/95	AKW	07/21/95	ASM	34	mg/kg	1.0
CADMIUM, SOLID	3050/7130	07/20/95	AKW	07/20/95	AKW	< 1.0	mg/kg	1.0
CHROMIUM, SOLID	3050/7190	07/20/95	AKW	07/21/95	AKW	1.7	mg/kg	1.0
LEAD, SOLID	3050/7420	07/20/95	AKW	07/20/95	AKW	4.1	mg/kg	1.0
MERCURY, SOLID	7471			07/24/95	AKW	< 0.02	mg/kg	0.02
SELENIUM, SOLID	3050/7740	07/20/95	AKW	07/20/95	ASM	9.0	mg/kg	1.0
SILVER, SOLID	3050/7760	07/20/95	AKW	07/19/95	AKW	< 1.0	mg/kg	1.0
TCLP Arsenic	1311/7061	07/18/95	AKW	07/20/95	ATR	< 0.001	mg/L	0.001
TCLP Barium	1311/7080	07/18/95	AKW	07/21/95	ASM	0.3	mg/L	0.1
TCLP Cadmium	1311/7130	07/18/95	AKW	07/20/95	AKW	< 0.005	mg/L	0.005
TCLP Chromium	1311/7190	07/18/95	AKW	07/21/95	AKW	< 0.05	mg/L	0.05
TCLP Lead	1311/7420	07/18/95	AKW	07/20/95	AKW	< 0.1	mg/L	0.1
TCLP Mercury	1311/7470	07/18/95	AKW	07/21/95	AKW	0.0008	mg/L	0.0002
TCLP Selenium	1311/7740	07/18/95	AKW	07/20/95	ASM	0.021	mg/L	0.002
TCLP Silver	1311/7760	07/18/95	AKW	07/19/95	AKW	< 0.010	mg/L	0.010

LABORATORY DIRECTOR Teresa W McClanahan

JUL-25-1995 16:16 HYDROLOGIC-MORRISVILLE 919 380 9717 P.08/10

Subcontractor: ALS - IN

Contact Name: Teresa

Date Shipped:

Comments:

SUBCONTRACT COC

Client Name: Front Royal

Project Number: 952646

Project: 6013-94-012

P.O. #: 41986

Report/Invoice To:
HydroLogic, Inc.
2500 Gateway Centre
Suite 900
Morrisville, NC 275[illegible]

919-380-9699
800-241-4174
919-380-9717 (Fax)

ONE SAMPLE PER LINE

SAMPLE TYPE

SAMPLE #	SAMPLE MATRIX	COMP	GRAB	DATE	TIME	GW	DW	WW	SLD	OTHER	ANALYSIS & METHOD
Comp A	SOIL			7/17/95	11:00					9116/c	TCLP Metals, Total Metal Recov
											Rec'd on ice

RELINQUISHED BY: Maggie Barbour

RECEIVED BY: K. Beaudet DATE/TIME: 7/18/95 8:

RELINQUISHED BY:

RECEIVED BY: DATE/TIME:

METHOD OF SHIPMENT:

HYDROLOGIC INC.
919 380 9717 P.02/03
JUL-25-1995 16:16
HYDROLOGIC-MORRISVILLE
ID:6153778799
JUL 25'95 11:30 No.006 P.02

REPORT TO: FRONT ROYAL ENV. SVCS.
ATTN. BRYAN

CHAIN OF CUSTODY

HydroLogic, Inc.
2500 Gateway Centre Blvd., Suite 900
Morrisville, NC 27560
800-241-4174
919-380-9699

PO # 41986

Method of Shipment

952646

PAGE ____ OF ____

CLIENT: NELCO TEER DURHAM QUARRY
PHONE: 469-9795
PROJ #: 0013-94-012 PO #: 41986
SAMPLER: SLF / BCG

PROJECT ID #:
REPORT DUE:
VERBAL FAX COPY HARD COPY

ANALYSES

FIELD ID	SAMPLE MATRIX	TIME COLLECTED	DATE COLLECTED	5030	3550	9071	1311 TCLP TOTAL ORG.	Total Metal & PCRA	8240	8270			REMARKS
COMP A	SOIL	11:00 am	7-17-95	✓	✓	✓	✓	Per Chris Reinhardt					7/17/95
													5030, 3550, 9071, 1311 TCLP
													Ky
													8240, 8270 TCLP Metals
													TN

RELINQUISHED BY: J. Freese	DATE / TIME: 4/17/95 1:15	RECEIVED BY: Magalene Barbour	DATE / TIME: 7/17/95 1:15
RELINQUISHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:
RELINQUISHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:
DISPATCHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:

H Y D R O L O G I C , I N C .

July 28, 1995

REPORTING:

HydroLogic-Morris., Inc.
2500 Gateway Centre
Suite #900
Morrisville, NC 27560

Attention: Pomeroy Smith

INVOICING:

HydroLogic-Morris., Inc.
2500 Gateway Centre
Suite #900
Morrisville, NC 27560

PROJECT NUMBER: FL9512238

DATE COMPLETED: July 28, 1995
DATE RECEIVED: July 21, 1995

PROJECT DESCRIPTION:

Front Royal/TEER #0013-94-012—1 soil sample analyzed for 3550/5030/9071/8240/8270/TCLP(8240/8270)/pH.

Enclosed is the laboratory report for the project described above. If you have any questions or if we can be of further assistance, please feel free to contact Jamie Fore. We appreciate your business and look forward to serving you again soon.

Respectfully,

Benjamin Carl Esterle
Laboratory Director

FAX TRANSMITTAL
HYDROLOGIC, RTP
No. Pages 13

To: Chris Reinhardt
Co: Front Royal
Dept:
From: Pomeroy S.
NOTE: Hydro.

H Y D R O L O G I C , I N C .

COMPANY NAME:	HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER:	FRONT ROYAL/TEER #0013-94-012
HYDROLOGIC PROJECT NUMBER:	FL9512238
HYDROLOGIC SAMPLE NUMBER:	9512238
HYDROLOGIC LAB I.D. #:	399
SAMPLE IDENTIFICATION:	COMP B
DATE SAMPLED:	7/20/95
DATE EXTRACTED:	7/24/95
DATE/TIME ANALYZED:	7/28/95 7/26/95

METHOD TPH 3550/5030

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Diesel		11.7	1040
Gasoline		2.0	BDL

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: GASOLINE: ESTIMATED QUANTITATION BASED ON REPEATED LOW SURROGATE RECOVERY DUE TO SAMPLE MATRIX INTERFERENCE

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95
DATE EXTRACTED: 7/24/95
DATE/TIME ANALYZED: 7/26/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Acenaphthene	83-32-9	3.0	BDL
Acenaphthylene	208-96-8	3.0	BDL
Aniline	62-53-3	3.0	BDL
Anthracene	120-12-7	3.0	BDL
Benzidine	92-87-5	3.0	BDL
Benzoic Acid	65-85-0	16.5	BDL
Benzo(a)Anthracene	56-55-3	3.0	BDL
Benzo(b)Fluoranthene	205-99-2	3.0	BDL
Benzo(k)Fluoranthene	207-08-9	3.0	BDL
Benzo(g,h,i)Perylene	191-24-2	3.0	BDL
Benzo(a)Pyrene	50-32-8	3.0	BDL
Benzyl Alcohol	100-51-6	6.5	BDL
Bis(2-Chloroethoxy)Methane	111-91-1	3.0	BDL
Bis(2-Chloroethyl)Ether	111-44-4	3.0	BDL
Bis(2-Chloroisopropyl)Ether	39638-32-9	3.0	BDL
Bis(2-Ethylhexyl)Phthalate	117-81-7	3.0	BDL
4-Bromophenyl Phenyl Ether	101-55-3	3.0	BDL
Butyl Benzyl Phthalate	85-68-7	3.0	BDL
4-Chloroaniline	106-47-8	6.5	BDL
1-Chloronaphthalene		3.0	BDL
2-Chloronaphthalene	91-58-7	3.0	BDL
4-Chloro-3-Methyl Phenol	59-50-7	6.5	BDL
2-Chlorophenol	95-57-8	3.0	BDL
4-Chlorophenyl Phenyl Ether	7005-72-3	3.0	BDL
Chrysene	218-01-9	3.0	BDL

HYDROLOGIC, INC.

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Dibenz(a,h)Anthracene	53-70-3	3.0	BDL
Dibenzofuran	132-64-9	3.0	BDL
Di-N-Butylphthalate	84-74-2	3.0	BDL
1,3-Dichlorobenzene	541-73-1	3.0	BDL
1,4-Dichlorobenzene	106-46-7	3.0	BDL
1,2-Dichlorobenzene	95-50-1	3.0	BDL
3,3'-Dichlorobenzidine	91-94-1	6.5	BDL
2,4-Dichlorophenol	120-83-2	3.0	BDL
2,6-Dichlorophenol	87-65-0	3.0	BDL
Diethylphthalate	84-66-2	3.0	BDL
A,A-Dimethylphenethylamine	122-09-8	3.0	BDL
2,4-Dimethylphenol	105-67-9	3.0	BDL
Dimethylphthalate	131-11-3	3.0	BDL
4,6-Dinitro-2-Methylphenol	534-52-1	16.5	BDL
2,4-Dinitrophenol	51-28-5	26.5	BDL
2,4-Dinitrotoluene	121-14-2	3.0	BDL
2,6-Dinitrotoluene	606-20-2	3.0	BDL
Diphenylamine	122-39-4	3.0	BDL
Di-N-Octylphthalate	117-84-0	3.0	BDL
Fluoranthene	206-44-0	3.0	BDL
Fluorene	86-73-7	3.0	BDL
Hexachlorobenzene	118-74-1	3.0	BDL
Hexachlorobutadiene	87-68-3	3.0	BDL
Hexachlorocyclopentadiene	77-47-4	3.0	BDL

H Y D R O L O G I C , I N C

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Hexachloroethane	67-72-1	3.0	BDL
Indeno(1,2,3-cd)Pyrene	193-39-5	3.0	BDL
Isophorone	78-59-1	3.0	BDL
2-Methylnaphthalene	91-57-6	3.0	BDL
2-Methylphenol	95-48-7	3.0	BDL
4-Methylphenol	106-44-5	3.0	BDL
Naphthalene	91-20-3	3.0	BDL
2-Nitroaniline	88-74-4	16.5	BDL
3-Nitroaniline	99-09-2	16.5	BDL
4-Nitroaniline	100-01-6	16.5	BDL
Nitrobenzene	98-95-3	3.0	BDL
2-Nitrophenol	88-75-5	3.0	BDL
4-Nitrophenol	100-02-7	16.5	BDL
N-Nitroso-Di-N-Butylamine	924-16-3	3.0	BDL
N-Nitrosodimethylamine	62-75-9	3.0	BDL
N-Nitrosodiphenylamine	86-30-6	3.0	BDL
N-Nitrosodipropylamine	621-64-7	3.0	BDL
Pentachlorophenol	87-86-5	16.5	BDL
Phenanthrene	85-01-8	3.0	BDL
Phenol	108-95-2	3.0	BDL
Pyrene	129-00-0	3.0	BDL
1,2,4,5-Tetrachlorobenzene	95-94-3	3.0	BDL
2,3,4,6-Tetrachlorophenol	58-90-2	3.0	BDL
1,2,4-Trichlorobenzene	120-82-1	3.0	BDL

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95

METHOD SW 846 8270

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
2,4,5-Trichlorophenol	95-95-4	3.0	BDL
2,4,6-Trichlorophenol	88-06-2	3.0	BDL

Surrogate Recovery:
2-Fluorobiphenyl
Nitrobenzene-d5
4-Terphenyl-D14
2-Fluorophenol
Phenol-D5
2,4,6-Tribromophenol

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: HIGH DETECTION LIMIT AND NO SURROGATE RECOVERY DUE TO A DILUTION FACTOR X 10 CAUSED BY SAMPLE MATRIX INTERIFERNCE.

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TERR #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95
DATE EXTRACTED: N/A
DATE/TIME ANALYZED: 7/28/95

METHOD SW 846 8240

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
Acetone	67-64-1	0.200	BDL
Acrolein	107-02-8	0.050	BDL
Acrylonitrile	107-13-1	0.050	BDL
Benzene	71-43-2	0.005	BDL
Bromodichloromethane	75-27-4	0.005	BDL
Bromoform	75-25-2	0.005	BDL
Bromomethane	74-83-9	0.01	BDL
2-Butanone	78-93-3	0.100	BDL
Carbon Disulfide	75-15-0	0.005	BDL
Carbon Tetrachloride	56-23-5	0.005	BDL
Chlorobenzene	108-90-7	0.005	BDL
Chloroethane	75-00-3	0.01	BDL
2-Chloro Ethyl Vinyl Ether	110-75-8	0.01	BDL
Chloroform	67-66-3	0.005	BDL
Chloromethane	74-87-3	0.01	BDL
Dibromochloromethane	124-48-1	0.005	BDL
Dibromomethane	74-95-3	0.005	BDL
1,4-Dichloro-2-Butane		0.005	BDL
Dichlorodifluoromethane	75-71-8	0.01	BDL
1,2-Dichlorobenzene	95-50-1	0.005	BDL
1,3-Dichlorobenzene	541-73-1	0.005	BDL
1,4-Dichlorobenzene	106-46-7	0.005	BDL
1,1-Dichloroethane	75-34-3	0.005	BDL
1,2-Dichloroethane	107-06-2	0.005	BDL
1,1-Dichloroethene	75-35-4	0.005	BDL

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95

METHOD SW 846 8240

ANALYSIS	CAS NO.	SDL (mg/kg)	RESULT (mg/kg)
trans-1,2-Dichloroethene	156-60-5	0.005	BDL
1,2-Dichloropropane	78-87-5	0.005	BDL
cis-1,3-Dichloropropene	10061-01-5	0.005	BDL
trans-1,3-Dichloropropene	10061-02-6	0.005	BDL
Ethanol	64-17-5	0.100	BDL
Ethylbenzene	100-41-4	0.005	BDL
Ethyl Methacrylate	97-63-2	0.01	BDL
2-Hexanone	591-78-6	0.050	BDL
Iodomethane	74-88-4	0.01	BDL
Methylene Chloride	75-09-2	0.005	BDL
4-Methyl-2-Pentanone	108-10-1	0.050	BDL
Styrene	100-42-5	0.01	BDL
1,1,2,2-Tetrachloroethane	79-34-5	0.01	BDL
Tetrachloroethylene	127-18-4	0.01	BDL
Toluene	108-88-3	0.005	BDL
1,1,1-Trichloroethane	71-55-6	0.005	BDL
1,1,2-Trichloroethane	79-00-5	0.005	BDL
Trichloroethylene	79-01-6	0.005	BDL
Trichlorofluoromethane	75-69-4	0.005	BDL
Vinyl Chloride	75-01-4	0.01	BDL
Xylene (Total)	1330-20-7	0.005	BDL
Surrogate Recoveries:			
1,2-Dichloroethane-D4			88%
Toluene-D8			72%
Bromofluorobenzene			108%

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

H Y D R O L O G I C , I N C .

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95
DATE EXTRACTED: 7/25/95
DATE/TIME ANALYZED: 7/27/95

METHOD TCLP 8240

ANALYSIS	CAS NO.	SDL (mg/L)	RESULT (mg/L)
Benzene	71-43-2	0.001	BDL
Carbon Tetrachloride	56-23-5	0.001	BDL
Chlorobenzene	108-90-7	0.001	BDL
Chloroform	67-66-3	0.001	BDL
1,4-Dichlorobenzene	106-46-7	0.001	BDL
1,2-Dichloroethane	107-06-2	0.001	BDL
1,1-Dichloroethene	75-35-4	0.001	BDL
2-Butanone	78-93-3	0.100	BDL
Tetrachloroethene	127-18-4	0.001	BDL
Trichloroethene	79-01-6	0.001	BDL
Vinyl Chloride	75-01-4	0.005	BDL
Surrogate Recoveries:			
1,2-Dichloroethane-D4			83%
Toluene-D8			95%
Bromofluorobenzene			96%

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

HYDROLOGIC, INC.

COMPANY NAME: HydroLogic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95
DATE EXTRACTED: 7/25/95
DATE/TIME ANALYZED: 7/28/95

METHOD TCLP 8270

ANALYSIS	CAS NO.	SDL (mg/l)	RESULT (mg/l)
1,4-Dichlorobenzene	106-46-7	0.05	BDL
2-Methylphenol	95-48-7	0.05	BDL
3-Methylphenol	108-39-4	0.05	BDL
4-Methylphenol	106-44-5	0.05	BDL
Hexachloroethane	67-72-1	0.05	BDL
Nitrobenzene	98-95-3	0.05	BDL
Hexachlorobutadiene	87-68-3	0.05	BDL
2,4,6-Trichlorophenol	88-06-2	0.05	BDL
2,4,5-Trichlorophenol	95-95-4	0.25	BDL
2,4-Dinitrotoluene	121-14-2	0.05	BDL
Hexachlorobenzene	118-74-1	0.05	BDL
Pentachlorophenol	87-86-5	0.25	BDL
Pyridine	110-86-1	0.50	BDL
Surrogate Recoveries:			
2-Fluorophenol			104%
Phenol-D6			82%
Nitrobenzene-D5			102%
2-Fluorobiphenyl			62%
2,4,6-Tribromophenol			70%
Terphenyl-D14			86%

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

H Y D R O L O G I C , I N C .

COMPANY NAME: Hydrologic-Morris., Inc.
COMPANY PROJECT NUMBER: FRONT ROYAL/TEER #0013-94-012

HYDROLOGIC PROJECT NUMBER: FL9512238
HYDROLOGIC SAMPLE NUMBER: 9512238
HYDROLOGIC LAB I.D. #: 399
SAMPLE IDENTIFICATION: COMP B
DATE SAMPLED: 7/20/95

ANALYSIS	DATE/TIME ANALYZED	METHOD	UNITS	SDL	RESULT
Oil and Grease	7/25/95	TPH 9071	mg/kg	10	618
pH	7/25/95	9045	pH	0	7.93

BDL = Below Sample Detection Limit
SDL = Sample Detection Limit

COMMENTS: _____

HYDROLOGIC, INC.

FINAL REPORT OF ANALYSES

HydroLogic, Inc. (MORRISVILLE)
2500 Gateway Centre
Suite 900
Morrisville, NC 27560-
Attn: Pomeroy Smith

REPORT DATE: 07/27/95

SAMPLE NUMBER- 9298 SAMPLE ID- ID# COM B
DATE SAMPLED- 07/20/95
DATE RECEIVED- 07/21/95 SAMPLER- CLIENT
TIME RECEIVED- 0840 DELIVERED BY- FEDX

SAMPLE MATRIX- SO
TIME SAMPLED- 1030
RECEIVED BY- KAB

Page 1 of 1

ANALYSIS	METHOD	SAMPLE PREP DATE	BY	ANALYSIS DATE	BY	RESULT	UNITS	DET. LIMIT
ARSENIC, SOLID	3050/7061	07/21/95	AKW	07/24/95	ASM	42	mg/kg	1.0
BARIUM, SOLID	3050/7080	07/21/95	AKW	07/26/95	ASM	170	mg/kg	1.0
CADMIUM, SOLID	3050/7130	07/21/95	AKW	07/24/95	ASM	< 1.0	mg/kg	1.0
CHROMIUM, SOLID	3050/7190	07/21/95	AKW	07/21/95	AKW	3.7	mg/kg	1.0
LEAD, SOLID	3050/7420	07/21/95	AKW	07/25/95	AKW	8.1	mg/kg	1.0
MERCURY, SOLID	7471			07/26/95	AKW	< 0.02	mg/kg	0.02
SELENIUM, SOLID	3050/7740	07/21/95	AKW	07/24/95	ASM	16	mg/kg	1.0
SILVER, SOLID	3050/7760	07/21/95	AKW	07/25/95	AKW	< 1.0	mg/kg	1.0
TCLP Arsenic	1311/7061	07/21/95	AKW	07/24/95	ASM	0.006	mg/L	0.002
TCLP Barium	1311/7080	07/21/95	AKW	07/27/95	ASM	0.6	mg/L	0.1
TCLP Cadmium	1311/7130	07/21/95	AKW	07/24/95	ASM	< 0.005	mg/L	0.005
TCLP Chromium	1311/7190	07/21/95	AKW	07/26/95	AKW	< 0.05	mg/L	0.05
TCLP Lead	1311/7420	07/21/95	AKW	07/25/95	AKW	< 0.1	mg/L	0.1
TCLP Mercury	1311/7470	07/21/95	AKW	07/24/95	AKW	0.0010	mg/L	0.0002
TCLP Selenium	1311/7740	07/21/95	AKW	07/24/95	ASM	< 0.005	mg/L	0.005
TCLP Silver	1311/7760	07/21/95	AKW	07/25/95	AKW	< 0.010	mg/L	0.010

LABORATORY DIRECTOR Teresa W McClanahan

502 875 8016 P.013/013 HYDROLOGIC KY JUL-28-1995 17:04 TOTAL P.13

CHAIN OF CUSTODY

HydroLogic, Inc.
2500 Gateway Centre Blvd., Suite 900
Morrisville, NC 27560
800-241-4174
919-380-9699

PO # 41991

Method of Shipment:

952714

PAGE 1 OF 1

TO: FRONT ROYAL ENVIRONMENTAL

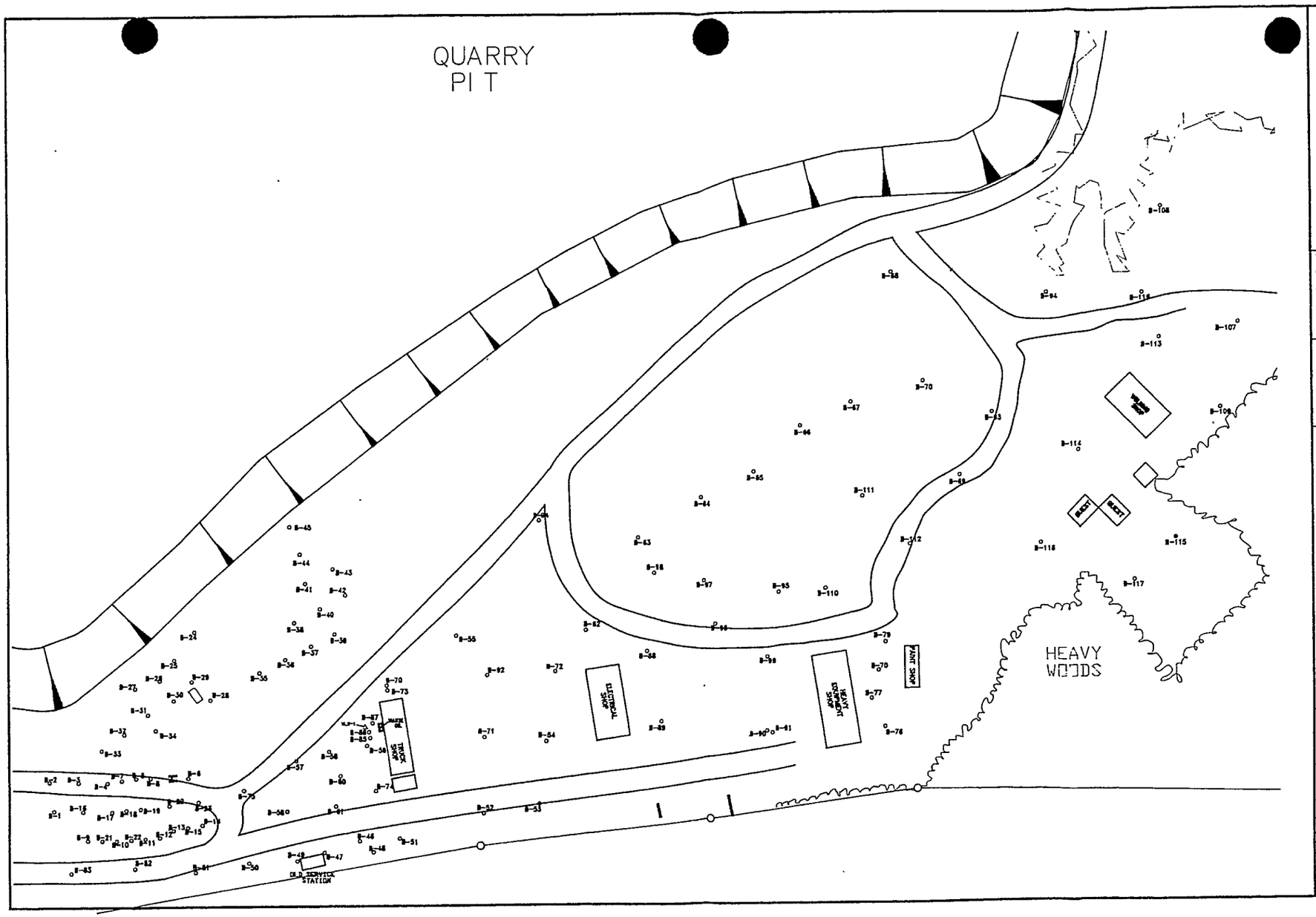
CLIENT: FRONT ROYAL - TEER
PHONE: 469-9795
PROJ #: 0013-94-012 PO #: 41991
SAMPLER: SLF/BCG

PROJECT ID #: 0013-94-012
REPORT DUE:
VERBAL FAX COPY HARD COPY

ANALYSES

FIELD ID	SAMPLE MATRIX	TIME COLLECTED	DATE COLLECTED	5030	3550	9071	8240	8270	pH	1311-TCLP metals	and total organics	TOTAL METALS	REMARKS
COMP B	SOIL	10:30am	7/21/95	✓	✓	✓	✓	✓	✓	✓		✓	*Per Chris Reinhart - run TCLP (8240/8270) JRF 7/21

RELINQUISHED BY: S. Freese	DATE / TIME: 7/20/95 11:05am	RECEIVED BY: Magdalene Sarbaw	DATE / TIME: 7/20/95 11:05
RELINQUISHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:
RELINQUISHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:
DISPATCHED BY:	DATE / TIME:	RECEIVED BY:	DATE / TIME:



FRONT ROYAL
ENVIRONMENTAL SERVICES, INC.
MORRISVILLE, NORTH CAROLINA

Engineer's Seal

SOIL BORING LOCATION MAP

NELLO L. TEER
DURHAM QUARRY

Revisions

FIGURE
Project No.
0013-94-012
Checked by
Scale 1" = 150'
Date Drawn

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-1 Date: 4/23/93	Boring# B-2 Date: 4/23/93	Boring# B-3 Date: 4/23/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	Light Brown Medium Silt : Tru	Light Brown Silt : Tru	Light Brown Silt : Tru
3	" "	" "	" "
4	" "	" "	" "
5	" "	Reddish Brown Silt : Tru	A. R. @ 5'
6	" "	" "	
7	" "	" "	
8	" "	" "	
9	Light Brown To Greenish Brown Very Hard	" "	
10	Silt : Tru	Light Red Brown Very Hard	
11	A. R. @ 11'	Silt To 13' Tru	
12		" "	
13		A. R. @ 13'	
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-4 Date: 4/23/93	Boring# B-5 Date: 4/23/93	Boring# B-6 Date: 4/23/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	Dark Brown Clay : Tru Small Odor	Dark Brown Silt : Tru Water At 3'	" "
4	" "	Hard Dark Brown Silt : Tru	Dark Brown Clay Tru
5	Reddish Brown Silt Tru	A. R. @ 5'	" "
6	" "		" "
7	" "		" "
8	Light Brown Silt Tru		Brown Sandy Clay Tru
9	" "		" "
10	" "		" "
11	" "		" "
12	Tan Silt : Tru		Reddish Brown Clay Tru
13	" "		" "
14	Light Brown Silt Tru		Reddish Brown Silt Tru
15	" "		" "
16	Hard Brown Silt Tru		" "
17	" "		" "
18	" "		" "
19	" "		Redish Brown Clayey Silt : Tru
20	A. R. @ 20'		" "
21			" "
22			Gray Silt To 32' Tru
23			" "
24			A. R. @ 32'
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-7 Date: 4/24/93	Boring# B-8 Date: 4/24/93	Boring# B-9 Date: 4/24/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	" "	Dark Brown Silt Tru	Dark Brown Clay Tru
4	" "	Water @ 3' A. R. @ 3'	" "
5	Dark Brown Clay Tru		" "
6	" "		" "
7	Dark Brown Silt : Tru		" "
8	" "		" "
9	" "		" "
10	" "		Brown Clay Tru
11	Gray Silt : Tru		Dark Brown Silt Tru
12	" "		" "
13	" "		" "
14	Reddish Brown Silt : Tru		Green Silt : Tru
15	" "		" "
16	Tan Silt : Tru		Reddish Gray Silt Tru
17	A. R. @ 16'		" "
18			" "
19			" "
20			" "
21			Light Gray Silt : Tru
22			A. R. @ 21'
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-10 Date: 4/24/93	Boring# B-11 Date: 4/24/93	Boring# B-12 Date: 4/24/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	Dark Brown Clay Tru	Dark Brown Clay Tru	Brown Silty Clay Tru
4	" "	" "	" "
5	Water @ 5'	" "	" "
6		Brown Silty Clay Slight Odor : Tru	" "
7		" "	" "
8		" "	" "
9		" "	" "
10		" "	" "
11		Brown Clay : Tru	" "
12		" "	" "
13		Green Silt : Tru	" "
14		" "	" "
15		" "	Tan Silty Clay Tru
16		" "	" "
17		" "	" "
18		" "	" "
19		" "	Brown Silt : Tru
20		" "	" "
21		Red Silt To 36' Tru	Green Silt To 25' Tru
22		" "	" "
23		" "	" "
24		" "	" "
25		" "	Red Silt From 25' To 28' Tru
		Red Wet Silt To 40' A.R. @ 40'	Reddish Brown Silt To 35' : Water @ 35'

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-13 Date: 4/24/93	Boring# B-14 Date: 4/24/93	Boring# B-15 Date: 4/25/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	Gravel Fill	Gravel Fill	Gravel Fill
3	Reddish Brown Silt Tru	Gravel Fill	Gravel Fill
4	" "	Brown Clay : Tru	Reddish Brown Clay : Tru
5	Brown Silt : Tru	" "	" "
6	" "	" "	" "
7	" "	" "	" "
8	" "	Tan Silt : Tru	Medium Brown Silt Tru
9	Green Silt : Tru	" "	Light Brown Fine Silt : Tru
10	Brown Silt : Tru	Light Brown Silt Tru	" "
11	" "	" "	Light Brown Medium Silty Clay : Tru
12	Light Gray Silt : Tru	" "	" "
13	" "	" "	" "
14	" "	" "	" "
15	" "	" "	Gray Fine Silt : Tru
16	A. R. @16'	" "	" "
17		" "	Light Gray Fine Silt : Tru
18		Gray Silt : Tru	" "
19		" "	" "
20		Water @ 20' A. R. @ 20'	A. R. @20'
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-16 Date: 4/25/93	Boring# B-17 Date: 4/25/93	Boring# B-18 Date: 4/25/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	Gravel Fill	Gravel Fill	Gravel Fill
3	Dark Brown Medium Silt : Tru	Gravel Fill	Dark Brown Fine Silt : Tru
4	" "	Dark Brown Clay Tru	Moist Dark Brown Fine Silt : Tru
5	A. R. @ 4'	" "	Wet Dark Brown Fine Silt : Tru
6		" "	Water @ 4.5'
7		Gray Fine Silt Tru	
8		" "	
9		" "	
10		" "	
11		" "	
12		" "	
13		" "	
14		" "	
15		" "	
16		" "	
17		" "	
18		Fine Green Silt : Tru	
19		" "	
20		" "	
21		Light Gray Fine Silt : Tru	
22		" "	
23		" "	
24		Water @ 23' A. R. 23'	
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-19 Date: 4/25/93	Boring# B-20 Date: 4/25/93	Boring# B-21 Date: 4/25/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	Gravel Fill	" "	" "
3	Dark Brown Fine Silt : Tru	Brown Silt : Tru	" "
4	Moist Dark Brown Fine Silt : Tru	Moist Dark Brown Silt : Tru	Wet Coarse Gravel And Brown Clay : Tru
5	" "	" "	" "
6	Wet Dark Brown Medium Silt : Tru	" "	Wet Coarse Brown Silt : Tru
7	" "	" "	" "
8	" "	" "	" "
9	" "	Moist Brown Silt Tru	" "
10	" "	" "	" "
11	Water At 10'	" "	Water @ 10'
12		Green Medium Silt Tru	
13		" "	
14		" "	
15		" "	
16		" "	
17		" "	
18		Red Fine Silt To 28' Tru	
19		" "	
20		" "	
21		" "	
22		Dark Brown Fine Silt 28'-33' : Tru	
23		Water @ 33'	
24		A. R. @ 33'	
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-22 Date: 4/25/93	Boring# B-23 Date: 4/25/93	Boring# B-24 Date: 4/25/93
1	Gravel Fill	Gravel Fill	Sand And Gravel Fill
2	Gravel Fill	Gravel Fill	" "
3	Gravel Fill	Gravel Fill	Dark Brown Medium Silt : Tru
4	Moist Dark Brown Fine Silt : Tru	Brown Medium Silt Tru	" "
5	" "	" "	" "
6	" "	Brown Clayey Medium Silt : Tru	" "
7	" "	" "	Moist Dark Brown Medium Silt : Tru
8	" "	" "	" "
9	Moist Brown Fine Silt : Tru	Green Fine Silt : Tru	Wet Dark Brown Medium Silt : Tru
10	" "	" "	" "
11	" "	Brown Silt : Tru	" "
12	Reddish Brown Fine Silt : Tru	" "	" "
13	" "	" "	" "
14	Green Fine Silt : Tru	" "	Water @ 13'
15	" "	A. R. @14'	
16	" "		
17	Reddish Gray Silt : Tru		
18	" "		
19	" "		
20	" "		
21	A. R. @ 20'		
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-25 Date: 4/25/93	Boring# B-26 Date: 4/30/93	Boring# B-27 Date: 4/30/93
1	Sand And Gravel Fill	Gravel Fill	Gravel Fill
2	" "	Gravel Fill	" "
3	" "	Brown Fine Silt : Tru	Fuel Stained Brown Fine Silt : Tru
4	Reddish Brown Medium Silt : Tru	" "	Moist Brown Fine Silt : Tru
5	" "	Moist Brown Fine Silt : Tru	" "
6	" "	" "	" "
7	" "	" "	" "
8	Moist Reddish Brown Medium Silt : Tru	" "	" "
9	" "	Wet Brown Fine Silt : Tru	Wet Brown Fine Silt : Tru
10	" "	" "	" "
11	" "	Water @ 10'	Water @ 10'
12	" "		
13	" "		
14	Water @ 13'		
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-28 Date: 4/30/93	Boring# B-29 Date: 4/30/93	Boring# B-30 Date: 4/30/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	Fine Gray Silt : Tru	Reddish Brown Fine Silt : Tru	Brown Fine Silt Tru
4	Medium Moist Brown Silt : Tru	Brown Fine Silt : Tru	" "
5	" "	" "	" "
6	" "	" "	" "
7	" "	Moist Brown Fine Silt : Tru	Moist Brown Fine Silt : Tru
8	Medium Wet Brown Silt : Tru	" "	" "
9	" "	Wet Brown Fine Silt : Tru	Water And A. R. @ 8'
10	" "	" "	
11	Water @ 10'	Water @ 10'	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-31 Date: 4/30/93	Boring# B-32 Date: 4/30/93	Boring# B-33 Date: 4/30/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	Dark Brown Fine Silt : Tru	Light Gray Fine Silt : Tru	Fuel Stained Brown Medium Silt : Tru
4	" "	" "	Moist Brown Medium Silt : Tru
5	Moist Brown Medium Silt : Tru	Moist Brown Medium Silt : Tru	" "
6	" "	" "	Light Brown Fine Silt : Tru
7	" "	Wet Brown Medium Silt : Tru	" "
8	Medium Wet Brown Silt : Tru	" "	" "
9	" "	Light Brown Coarse Silt : Tru	Reddish Brown Medium Silt : Tru
10	" "	" "	Light Brown Medium Silt : Tru
11	Water @ 10'	Reddish Brown Medium Silt : Tru	A. R. @ 10'
12		" "	
13		Light Brown Medium Silt : Tru	
14		" "	
15		Water And A. R. @14'	
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-34 Date: 4/30/93	Boring# B-35 Date: 5/01/93	Boring# B-36 Date: 5/01/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	Brown Medium Silt : Tru	Gray Fine Silt : Tru	Brown Fine Silt : Tru
4	Moist Brown Fine Silt : Tru	" "	" "
5	" "	" "	" "
6	" "	Moist Brown Fine Silt : Tru	" "
7	Light Gray Fine Silt : Tru	" "	Moist Brown Fine Silt : Tru
8	" "	" "	" "
9	Wet Brown Fine Silt : Tru	Wet Brown Fine Silt : Tru	" "
10	" "	" "	" "
11	Water @ 10'	Water @10'	" "
12			" "
13			Wet Brown Fine Silt : Tru
14			" "
15			" "
16			Water @ 15'
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-37 Date: 5/01/93	Boring# B-38 Date: 5/01/93	Boring# B-39 Date: 5/01/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	" "	Gray Sandy Coarse Silt : Tru	Dark Brown Fine Silt : Tru
4	Brown Fine Silt : Tru	" "	A. R. @ 3'
5	" "	Dark Brown Medium Silt : Tru	
6	" "	" "	
7	Moist Brown Medium Silt : Tru	" "	
8	" "	" "	
9	" "	" "	
10	" "	" "	
11	" "	" "	
12	" "	" "	
13	" "	" "	
14	" "	" "	
15	" "	Moist Dark Brown Fine Silt : Tru	
16	Gray Fine Silt : Tru	" "	
17	" "	" "	
18	" "	" "	
19	" "	" "	
20	" "	Orange Medium Silt : Tru	
21	A. R. @ 20'	Water And A. R. @ 20'	
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-40 Date: 5/01/93	Boring# B-41 Date: 5/02/93	Boring# B-42 Date: 5/02/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	Brown Medium Silt Tru	" "	Brown Sandy Silt : Tru
4	" "	" "	" "
5	" "	Coarse Gray Sandy Clay : Tru	" "
6	" "	" "	" "
7	Dark Brown Medium Silt : Tru	" "	" "
8	" "	" "	" "
9	" "	" "	" "
10	" "	" "	Moist Dark Brown Fine Silt : Tru
11	" "	" "	" "
12	" "	Sticky Brown Fine Silt : Tru	" "
13	Moist Brown Silt : Tru	" "	" "
14	" "	Water @13'	" "
15	" "		Water @ 14'
16	Water @ 15'		
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-43 Date: 5/02/93	Boring# B-44 Date: 5/02/93	Boring# B-45 Date: 5/02/93
1	Gravel Fill	Sand And Gravel Fill	Sand And Gravel Fill
2	" "	" "	" "
3	Gray Medium Silt Tru	" "	" "
4	Brown Medium Silt Tru	Gray Coarse Sand Tru	" "
5	A. R. @ 4'	" "	Dark Brown Sandy Silt : Tru
6		" "	" "
7		Sandy Gray Coarse Clay : Tru	" "
8		" "	" "
9		" "	" "
10		" "	" "
11		Water @ 10'	A. R. @ 10'
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: CHARLES HOOPER

	Boring# B-46 Date: 5/04/93	Boring# B-47 Date: 5/05/93	Boring# B-48 Date: 5/05/93
1	Gravel Fill	Asphalt 0-2" Gravel 2"-1'	Gravel Fill
2	Brown Silty Sand Tru	Dark Brown Clayey Silt : Tru	Clayey Brown Silt : Tru
3	" "	" "	Reddish Brown Silt : Tru
4	" "	" "	" "
5	" "	A. R. @ 4'	" "
6	Light Brown Silty Sand : Tru		" "
7	" "		" "
8	" "		" "
9	" "		" "
10	" "		" "
11	Gray Silty Sand To 25' : Tru		Light Brown Silt Tru
12	" "		" "
13	" "		" "
14	" "		" "
15	" "		" "
16	" "		Tan Silt : Tru
17	" "		" "
18	" "		Gray Silt : Tru
19	" "		Water @ 18.5'
20	" "		
21	" "		
22	" "		
23	" "		
24	" "		
25	" "		

Light Gray Silty Sand To 30'
Dark Brown Silt 30' To 34'
Water @ 34' : Tru

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: CHARLES HOOPER

	Boring# B-49 Date: 5/05/93	Boring# B-50 Date: 5/05/93	Boring# B-51 Date: 5/06/93
1	Gravel Fill	Sand And Gravel	Gravel Fill
2	Brown Clayey Silt : Tru	Clayey Brown Sand Tru	Light Brown Clayey Sand : Tru
3	Greenish Gray Clayey Silt : Tru	" "	Orange Brown Silt : Tru
4	" "	Orange Clayey Silt : Tru	" "
5	" "	" "	" "
6	Light Brown Silt : Tru	" "	" "
7	" "	Dark Reddish Brown Silt : Tru	Brown Silt : Tru
8	Tan Clayey Silt : Tru	" "	Orange Brown Silt : Tru
9	" "	" "	" "
10	Water @ 9'	" "	" "
11		" "	" "
12		" "	Dark Brown Silt : Tru	" "
13		" "	" "
14		" "	" "
15		" "	" "
16		" "	" "
17		" "	Brown Silt : Tru
18		A. R. @ 18.5'	" "
19			" "
20			Water @ 20'
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: CHARLES HOOPER

	Boring# B-52 Date: 5/06/93	Boring# B-53 Date: 5/06/93	Boring# B-54 Date: 5/7/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	Orange Brown Silt : Tru	Dark Brown Silt : Tru	Tan Silt : Tru
3	" "	" "	" "
4	" "	" "	" "
5	" "	" "	" "
6	" "	" "	" "
7	" "	" "	" "
8	" "	Reddish Brown Silt : Tru	Reddish Brown Silt : Tru
9	" "	" "	" "
10	Brown Silt : Tru	Fine Light Brown Silt : Tru	A. R. @10'
11	" "	" "	
12	Water @ 12'	" "	
13		Water @ 12'	
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: CHARLES HOOPER

	Boring# B-55 Date: 5/10/93	Boring# B-56 Date: 5/15/93	Boring# B-57 Date: 5/15/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	Tan Silt : Tru	" "	Dark Brown Medium Silt : Tru
3	Dark Brown Reddish Silt : Tru	Brown Silt : Tru	" "
4	" "	" "	" "
5	A. R. @4'	" "	Light Brown Silt Tru
6		" "	" "
7		" "	" "
8		" "	Light Brown Silt : Tru	" "
9		" "	" "
10		" "	" "
11		" "	Moist Dark Brown Fine Silt : Tru	" "
12		" "	Gray Brown Silt Tru
13		" "	" "
14		" "	A. R. @14'
15		Water At 15'	
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-58 Date: 5/15/93	Boring# B-59 Date: 5/15/93	Boring# B-60 Date: 5/15/93
1	Gravel Fill	Grvel Fill	Gravel Fill
2	" "	Dark Brown Silt Tru	Moist Brown Medium Silt : Tru
3	Green Medium Silt Tru	" "	" "
4	Brown Clayey Silt Tru	A. R. @ 3'	Brown Fine Silt : Tru
5	" "		" "
6	" "		Moist Brown Medium Silt : Tru
7	Green Fine Silt Tru		" "
8	" "		" "
9	Dark Brown Silt Tru		" "
10	" "		" "
11	" "		Brown Clayey Fine Silt : Tru
12	Light Brown Fine Silt Tru		" "
13	Dark Brown Silt Tru		" "
14	" "		" "
15	A. R. @ 14'		" "
16			Fine Brown Silt Tru
17			" "
18			" "
19			" "
20			" "
21			Water @ 20'
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-61 Date: 5/15/93	Boring# B-62 Date: 5/16/93	Boring# B-63 Date: 5/16/93
1	Gravel Fill	Grvel Fill	Gravel Fill
2	Brown Clayey Medium Silt : Tru	Gray Brown Fine Silt : Tru	Gray Fine Silt : Tru
3	" "	" "	" "
4	Diabase Boulder	A. R. @ 3'	" "
5	Brown Moist Medium Silt : Tru		Brown Fine Silt : Tru
6	" "		" "
7	" "		" "
8	" "		A. R. @ 7'
9	" "		
10	" "		
11	" "		
12	" "		
13	" "		
14	" "		
15	Water @ 15'		
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-64 Date: 5/16/93	Boring# B-65 Date: 5/16/93	Boring# B-66 Date: 5/16/93
1	Fill Material	Fill Material	Rock , Dust And Screenings
2	" "	" "	" "
3	" "	" "	" "
4	Fill And Boulders	Brown Coarse Silt : Tru	" "
5	" "	" "	Water @ 5'
6	" "	Gray Fine Silt : Tru	
7	" "	" "	
8	Brown Moist Medium Silt : Tru	" "	
9	" "	Wet Gray Fine Silt : Tru	
10	" "	" "	
11	Water @ 10'	Water @ 10'	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-67 Date: 5/16/93	Boring# B-68 Date: 5/16/93	Boring# B-69 Date: 5/16/93
1	Organic Material From Small Pond	Gravel Fill	Gravel Fill
2	Asphalt	" "	" "
3	" "	Brown Clayey Fine Silt : Tru	Light Brown Coarse Silt : Tru
4	Dust And Screenings	" "	" "
5	" "	" "	Dark Brown Medium Silt : Tru
6	Water @ 5'	Moist Fine Brown Silt : Tru	" "
7		" "	" "
8		" "	Dark Brown Fine Clayey Silt : Tru
9		" "	" "
10		" "	" "
11		Water @ 10'	" "
12			" "
13			" "
14			" "
15			Brown Clayey Fine Silt : Tru
16			" "
17			" "
18			" "
19			" "
20			Water @ 20'
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
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SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: BILLY BOULWARE

	Boring# B-70 Date: 5/17/93	Boring# B-71 Date: 5/17/93	Boring# B-72 Date: 5/17/93
1	Gravel Fill	Gravel Fill	Gravel Fill
2	" "	" "	" "
3	Light Brown Silt : Tru	Dark Brown Fine Silt : Tru	Dark Brown Fine Silt : Tru
4	" "	" "	A. R. @ 3'
5	Dark Reddish Brown Silt : Tru	" "	
6	" "	" "	
7	" "	" "	
8	" "	" "	
9	" "	" "	
10	" "	" "	
11	" "	" "	
12	" "	" "	
13	" "	" "	
14	" "	" "	
15	" "	" "	
16	Dark Brown Medium Silt : Tru	" "	
17	" "	" "	
18	" "	" "	
19	Light Brown Fine Silt : Tru To 30'	" "	
20	" "	Water @ 20'	
21	" "		
22	" "		
23	" "		
24	" "		
25	Water @ 30'		

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: BILLY BOULWARE

	Boring# B-73 Date: 5/17/93	Boring# B-74 Date: 5/17/93	Boring# B-75 Date: 5/22/93
1	Tan Silt Fill 0-3" Asphalt 3"-5"	Gravel Fill	Gravel Fill
2	Dark Brown Silt 5'-5' Tru	Dark Brown Silt Tru	" "
3	" "	" "	Light Brown Medium Silty Clay : Tru
4	" "	" "	" "
5	" "	Tan Silt : Tru	" "
6	A. R. @ 5'	" "	" "
7		Dark Brown Fine Silt Tru	" "
8		" "	Light Brown Medium Sandy Clay : Tru
9		" "	" "
10		" "	" "
11		" "	" "
12		" "	" "
13		" "	Fine Grayish Red Silty Stone : Tru
14		" "	" "
15		" "	" "
16		" "	" "
17		" "	" "
18		" "	" "
19		" "	Fine Gray Siltstone Tru
20		" "	" "
21		" "	" "
22		" "	" "
23		" "	" "
24		Water @ 25'	Water @ 25'
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: DON SMITH

	Boring# B-76 Date: 5/25/93	Boring# B-77 Date: 5/25/93	Boring# B-78 Date: 5/21/93
1	Gravel	5" Gray Crushed Stone	Asphalt / Gravel
2	Auger Refusal @ 2'	Burgandy Sli Clay Medium Plastic : Tru	
3		Red Brown Plastic Silty Clay : Tru	Fine Dark Brown Clay Tru
4		" "	
5		" "	
6		" "	
7		Brown Stiff Mottled Clay W/very Thin Gray Lenses Tru	Tan Clay : Tru
8		" "	
9		Light Green Micaceous Silty Clay : Tru	
10		" "	Rock
11		" "	Tan Clay : Tru
12		Burgandy Micaceous Sandy Clay W/ Gray Mix	
13		Of Sand Grains : Tru	
14		" "	Rock
15		Burgandy Tru Shales To 20'	Tan Clay : Tru
16		" "	
17		" "	Fine Rock
18		" "	
19		" "	Tan Clay : Tru
20			Rock, Stiff Clay : Tru
21			Auger Refusal @ 22'
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: DON SMITH

	Boring# B-79 Date: 5-22-92		Boring# B-80 Date: 5-22-93		Boring# Date:	
	Marked But Not Drilled Yet		# Has Not Been Used Yet			
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-81 Date: 5-22-93	Boring# B-82 Date: 5-22-93	Boring# B-83 Date: 5-22-93
1	Gravel	Gravel	Gravel
2	Medium Brown Clay Tru	" "	" "
3	Reddish Medium Brown Silt, Stone : Tru	Medium Reddish Brown Clay : Tru	" "
4	" "	" "	" "
5	" "	" "	" "
6	" "	" "	" "
7	" "	Medium Reddish Brown Silt , Stone : Tru	" "
8	" "		Coarse Brown Clay Tru
9	" "	Fine Brown Silt, Stone Tru	" "
10	" "	" "	Ground Water @ 10'
11	" "	" "	
12	Fine Red Silt Stone : Tru	" "	
13	" "	Fine Red Silt, Stone Tru	
14	Fine Gray Silt Stone : Tru	" "	
15	" "	" "	
16	" "	" "	
17	" "	" "	
18	" "	" "	
19		Fine Gray Siltstone Tru	
20	Ground Water @ 20'	" "	
21		" "	
22		Powdery Fine Gray Silt Stone : Tru	
23		" "	
24		" "	
25		" "	

26-30' RED SILT
STONE: TRU
GROUND WATER @ 30'

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: DON SMITH

	Boring# B-84 Date: 5-22-93	Boring# B-85 Date: 5-25-93	Boring# B-86-1 Date: 5-25-93
1	Gravel And Fill Material	Crushed Stone Base	Hit Pvc Water Line Line Had Not Been
2	" "	Material W/ High Petroleum Smell, Red Plastic Clay (auger Flight	Witched " "
3	" "	Smelled Of Methane & Hit Water : Tru	
4	" "	Gray Very Wet Silty Clay Tru	
5	" "		
6	" "		
7	" "		
8	" "		
9	Ground Water @ 10'		
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Give Colors

Water Table

Gravel

Sand or Sandstone

Clay or Silt

Clayey Sand

Limestone

Shale

Igneous Rock

Metamorphic Rock

C = Coarse
M = Medium
F = Fine
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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: DON SMITH

	Boring# B-86 Date: 5-25-93	Boring# B-86-BH Date: 5-25-93	Boring# B-87 Date: 5-25-93
1	Crushed Stone	Gray Crushed Stone W/ Broken Pvc Pipe	Base Coarse
2	" "	" "	" "
3	Reddish Brown Base Material	Back Hoe Dug Through	Red Plastic Clay Tru
4	Gray To Gray Green Fill Material Meta Volcanic	Stone To Stiff Red Brownish Plastic Clay	" "
5	Tru	Tru Sample Taken W/ Hand	" "
6	" "	Auger	Very Hard Float Rock
7	" "		" "
8	" "		Rock Refusal @ 7'
9	Sandy Burgandy Clay Tru : Grading To Plastic		
10	Micaceous Silty Clay		
11	" "		
12	" "		
13	Alternating Beds Of Light Burgandy : Tru Siltstones		
14	& Shales Undifferentiated		
15	Medium Hard To Hard		
16	" "		
17	" "		
18	" "		
19	" "		
20	Wet @ 20'		
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: DON SMITH

	Boring# TP-1 Date: 5-25-93	Boring# B-88 Date: 5-26-93	Boring# B-89 Date: 5-26-93
1	Gray Waste Oil Saturated Rock	Very Coarse Base Stone	Rock Base
2	" "	" "	" "
3	Sample Taken Below Crushed Stone In Red Brown, Very Stiff, Plastic Clay : Tru	Reddish Brown Medium Plastic Stiff Silty Clay Tru	Dark Red Slightly Plastic Tru Silty Clay
4		" "	" "
5		" "	" "
6		" "	" "
7		" "	" "
8		" "	" "
9		" "	Stiff Drilling Siltstone-cuttings Light
10		Drk Red Mottled W/ Black Medium Plastic Silty Clay Tru	Pink-tan
11		" "	" "
12		" "	" "
13		" "	" "
14		Moderately Stiff	" "
15		Dark Burgandy, Medium Stiff, Medium Plastic Tru Shales, Silty Clay	Red Brown Siltstone Tru
16			" "
17		Slighty Mottled W/ Grey Green & Black Lenses	Auger Refusal @ 18'
18		Grades To Burgandy, Silty Shale	
19		" "	
20		" "	
21		" "	
22		" "	
23		" "	
24		" "	
25		28' VERY HARD TRU : SILTSTONE 30' RED SILTY CUTTINGS TRU	

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

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Gr = Gravel
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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: DON SMITH

	Boring# B-90 Date: 5-26-93	Boring# B-91 Date: 5-26-93	Boring# B-92 Date: 6-1-93
1	Crushed Stone	Large Boulder Or Float	Gravel Fill
2	Rock Refusal @ 2'	" "	" "
3		" "	Reddish Brown Siltstone Tru
4		Plastic, Orange & Gray Mottled Micaceous ,	" "
5		Silty Clay : Tru	" "
6		" "	" "
7		" "	" "
8		Vtiff, Tight Drilling, Red Brown Slightly Mottled	" "
9		Silty Clay Tru	Dark Brown Silty Clay Tru
10		" "	" "
11		" "	" "
12		Stiff Red-tan Slightly Mottled Silty Clay ; Tru	" "
13		" "	Dark Brown Fine Silt Tru
14		" "	" "
15		" "	" "
16		" "	" "
17		" "	" "
18		" "	" "
19		" "	Moist Brown Fine Silt : Tru
20		" "	" "
21		Tru : Dark Red Shale	Light Brown Moist Siltstone To 24' : Tru
22		Micaceous Silty Clay Tru	" "
23		" "	" "
24		Very Stiff Tru Siltstone Tru	Water @ 24'
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-93 Date:		Boring# B-94 Date:		Boring# B-95 Date: 6-1-93	
	Marked But Not Drilled Yet		# Has Not Been Used Yet		Gravel	
1					" "	
2					Brown Silty Clay Tru	
3					" "	
4					" "	
5					" "	
6					" "	
7					Water @ 7'	
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-96 Date: 6-1-93	Boring# B-97 Date: 6-1-93	Boring# B-98 Date: 6-1-93
1	Gravel Fill	Gravel Fill	Garvel Fill
2	" "	Boulder	" "
3	Brown Siltstone Tru	" "	" "
4	" "	Dark Brown Clay Tru	Brown Wet Clay And Rock : Tru
5	" "	" "	" "
6	" "	" "	Water @ 5'
7	" "	" "	
8	" "	Moist Brown Clay Tru	
9	Dark Brown Sity Clay Tru	" "	
10	" "	" "	
11	" "	Water @ 10'	
12	" "		
13	Dark Brown Siltstone Tru		
14	" "		
15	" "		
16	" "		
17	" "		
18	" "		
19	" "		
20	" "		
21	" "		
22	" "		
23	Moist Brown Siltstone Tru		
24	" "		
25	Water @ 25'		

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-99 Date:	Boring# B-100 Date:	Boring# B-101 Date: 6-4-93
1			Gravel & Asphalt
2			" "
3			Medium Brown Silty Clay Tru
4			" "
5			" "
6			" "
7			Medium Red Mud Stone Tru
8			" "
9			" "
10			" "
11			Medium Brown Mud Stone : Tru
12			" "
13			" "
14			Fine Reddish Brown Mud Stone ; Tru
15			" "
16			" "
17			Fine Brown Silty Stone Tru
18			" "
19			" "
20			" "
21			Fine Reddish Brown Siltuy Stone ; Tru
22			To 30'
23			" "
24			" "
25			Groundwater@ 30'

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
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F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-105 Date:	Boring# B-106 Date:	Boring# B-107 Date: 6-4-93
1		Gravel	Brown Medium Silty Clay Tru
2		Medium Red Silty Clay Tru	" "
3		" "	" "
4		" "	" "
5		" "	" "
6		" "	" "
7		Coarse Brown Silt Stone Tru	Medium Gray Sandy Mud Tru
8		" "	" "
9		" "	Groundwater @ 10'
10		Fine Red Mud Stone Tru	
11		" "	
12		" "	
13		" "	
14		" "	
15		" "	
16		Fine Brown Silt Stone Tru	
17		" "	
18		" "	
19		Groundwater @ 20'	
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
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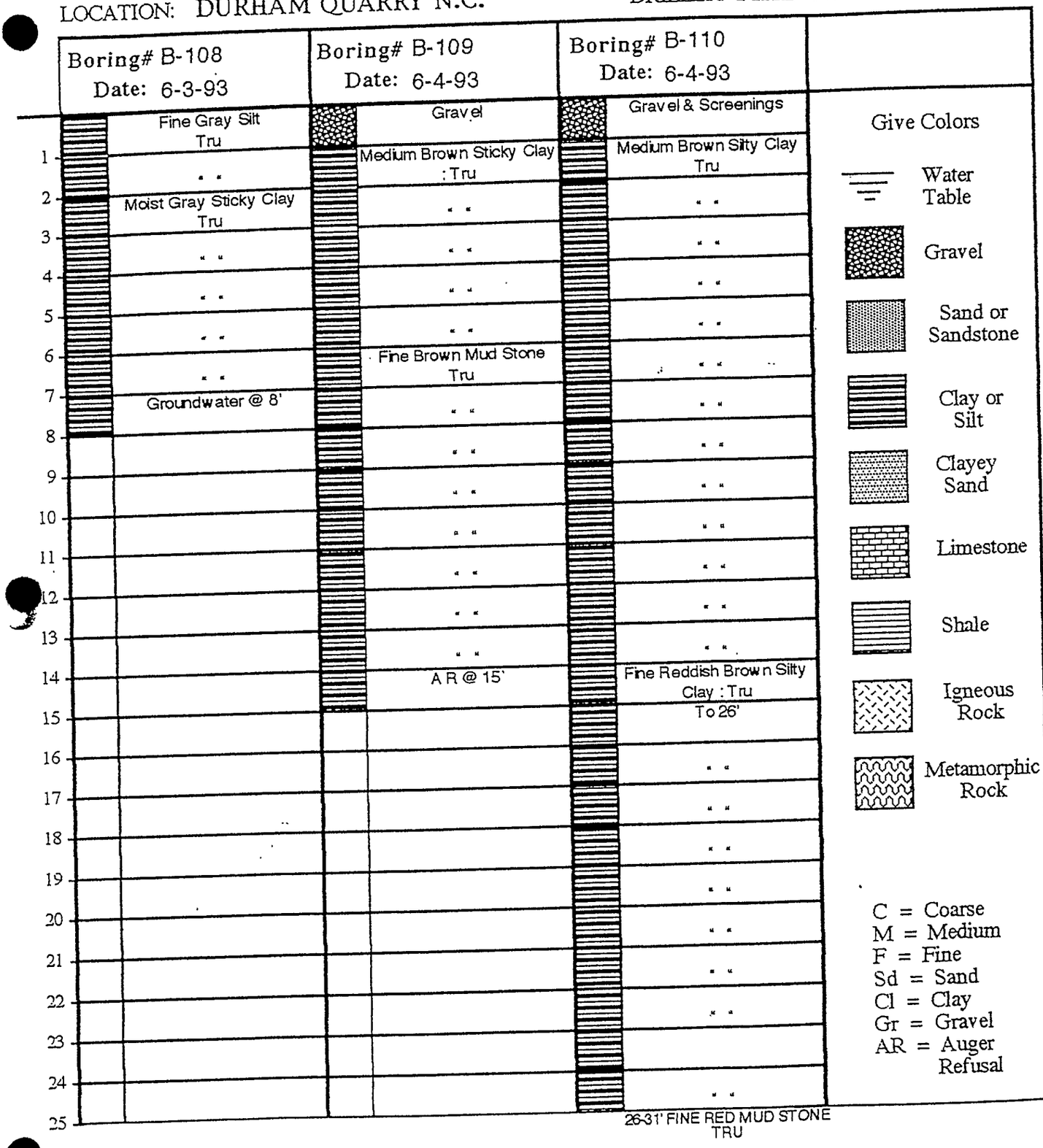
GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS



GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-111 Date: 6-3-93	Boring# B-112 Date: 6-3-93	Boring# B-113 Date: 6-4-93
	Gravel	Gravel	Gravel
1	Fine Blue Gray Clay Tru	Fine Brown Silt Stone Tru	Medium Brown Silty Clay Tru
2	" "	" "	" "
3	Coarse Red Mud Stone Tru	" "	" "
4	" "	" "	Medium Red Mud Stone Tru
5	" "	" "	" "
6	Fine Light Brown Silty Stone : Tru	AR @ 7'	" "
7	" "		" "
8	" "		" "
9	Groundwater @ 10'		" "
10			" "
11			" "
12			" "
13			" "
14			" "
15			Fine Red Mud Stone Tru
16			" "
17			" "
18			" "
19			Groundwater @ 20'
20			
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
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Sd = Sand
Cl = Clay
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AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-114 Date: 6-7-93	Boring# B-115 Date: 6-7-93	Boring# B-116 Date: 6-4-93
	Coarse Sand	Brown Medium Silt Tru	Gravel & Asphalt
1	Brown Silty Clay Tru	" "	Medium Brown Silty Clay Tru
2	" "	" "	" "
3	Brown Meduim Mudstone Tru	" "	" "
4	" "	" "	" "
5	Red Medium Mudstone Tru	" "	" "
6	" "	Red Fine Silt Tru	Medium Red Mud Stone Tru
7	" "	" "	" "
8	" "	" "	" "
9	" "	" "	" "
10	" "	" "	" "
11	" "	" "	" "
12	" "	Reddish Brown Mudstone : Tru	" "
13	" "	" "	" "
14	" "	" "	" "
15	" "	" "	Fine Light Brown Silty Stone : Tru
16	" "	" "	" "
17	" "	" "	" "
18	Fine Red Mudstone To 32' : Tru	" "	Groundwater @ 19'
19	" "	" "	" "
20	" "	Reddish Brown Fine Siltstone : Tru	
21	" "	" "	
22	" "	" "	
23	" "	" "	
24	A. R. @ 32'	A. R. @ 24'	
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
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GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-117 Date: 6-4-93	Boring# Date:	Boring# Date:	
	Gravel & Asphalt			Give Colors
1	Medium Brown Silty Clay Tru			Water Table
2	" "			
3	" "			Gravel
4	Fine Brown Silt Stone Tru			
5	" "			Sand or Sandstone
6	" "			
7	" "			Clay or Silt
8	" "			
9	Groundwater @ 10'			Clayey Sand
10				
11				Limestone
12				
13				Shale
14				
15				Igneous Rock
16				
17				Metamorphic Rock
18				
19				
20				C = Coarse M = Medium F = Fine Sd = Sand Cl = Clay Gr = Gravel AR = Auger Refusal
21				
22				
23				
24				
25				

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: TEER COMPANY

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# B-118 Date: 7/22/93	Boring# B-119 Date: 7/22/93	Boring# B-120 Date: 7/26/93
1	Gravel	Sand Used For Making Asphalt	Loose Fill Material
2	" "	" "	Gravel; Screenings Pea Gravel Up To
3	Fine Brown Silty Clay Tru	" "	Rip Rap Sized Rock; And Wood To 15'
4	" "	" "	" "
5	" "	" "	" "
6	" "	" "	" "
7	" "	" "	" "
8	" "	Fine Brown Silty Clay Tru	" "
9	" "	" "	" "
10	" "	" "	" "
11	" "	" "	" "
12	" "	Gray Siltstone Tru	" "
13	" "	" "	" "
14	" "	" "	" "
15	" "	" "	" "
16	Blue Gray Diabase To 75'	" "	
17	" "	" "	
18	" "	Red Mudstone To 68' Diabase At 68': Tru	
19	" "	" "	
20	" "	" "	
21	" "	" "	
22	" "	" "	
23	" "	" "	
24	" "	" "	
25	" "	" "	
	WAS GOING TO BE MW-1 BUT WATER NOT ENCOUNTERED	WAS GOING TO BE MW-2 BUT WATER NOT ENCOUNTERED	WAS GOING TO BE MW-3 BUT WATER NOT ENCOUNTERED

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay or Silt
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

GEONETICS CORPORATION
SOIL BORING LOGS

PROJECT #: 10293 CLIENT: NELLO TEER

LOCATION: DURHAM QUARRY N.C. DRILLER: PHIL ANDREWS

	Boring# SB-1 Date: 7/19/93	Boring# SB-2 Date: 7/20/93	Boring# Date:
1	Gravel Fill	Gravel Fill	
2	" "	Brown Silty Clay : Sap	
3	Brown Silty Clay : Sap	" "	
4	" "	" "	
5	" "	" "	
6	" "	Boulder	
7	" "	Brown Siltstone : Sap	
8	Brown Siltstone : Sap	" "	
9	Tan Siltstone : Sap	Reddish Brown Siltstone Sap	
10	" "	" "	
11	Gray Siltstone : Sap	Gray Brown Siltstone Sap	
12	" "	" "	
13	Brown Siltstone : Sap	" "	
14	" "	" "	
15	" "	" "	
16	Blue Gray Siltstone Sap	Gray Siltstone : Sap	
17	" "	" "	
18	" "	" "	
19	" "	" "	
20	E. O. H. @ 20'	E. O. H. @ 20'	
21			
22			
23			
24			
25			

Give Colors

- Water Table
- Gravel
- Sand or Sandstone
- Clay
- Clayey Sand
- Limestone
- Shale
- Igneous Rock
- Metamorphic Rock

C = Coarse
M = Medium
F = Fine
Sd = Sand
Cl = Clay
Gr = Gravel
AR = Auger Refusal

Appendix D

Laboratory Results - Soil Survey

SOIL TEST REPORT

AGRONOMIC DIVISION, N.C. DEPT. OF AGRICULTURE
4300 REEDY CREEK ROAD
RALEIGH, N.C. 27607-6465

PHONE: (919) 733-2655

COPIES SENT TO:
X COUNTY EXTENSION DIRECTOR

REPORT [redacted]27812

04/17/95

TO: NELLO L. TEER
PO BOX 4350
CARY NC 27519-

DAVID MEYER CARY

FARM LOCATION (COUNTY): DURHAM

SERVING N.C. CITIZENS FOR OVER 50 YEARS

Sample 001

FIELD INFORMATION							TEST RESULTS *																
SAMPLE NO	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O	SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
001							MIN	0.2	1.41	12.0	100	0.0	7.6	008	38	83.3	15.2	266	138	326					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **													SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **										
CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE	CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4											

Sample 002

FIELD INFORMATION							TEST RESULTS *																
SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O	SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
002							MIN	0.0	1.51	5.9	100	0.0	7.9	004	14	91.4	7.4	183	058	54					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **													SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **										
CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE	CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4											

Sample 003

FIELD INFORMATION							TEST RESULTS *																
SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O	SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
003							MIN	0.0	1.35	16.1	100	0.0	7.9	004	40	67.6	31.1	625+	052	342					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **													SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **										
CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE	CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4											

Sample 004

FIELD INFORMATION							TEST RESULTS *																
SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O	SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
004							MIN	0.0	1.42	7.3	100	0.0	7.9	008	24	76.5	21.9	625+	107	332					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **													SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **										
CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE	CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4											

Sample

FIELD INFORMATION							TEST RESULTS *																
SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O	SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **													SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **										
CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE	CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE

* TEST RESULTS (N.C. tests will not compare directly to numbers obtained by other methods.)

Soil Class: MIN = Mineral, M-O = Mineral-Organic, ORG = Organic
HM-% = Humic Matter, Percent by vol.
W/V = Weight per Volume, g/cm³
CEC = Cation Exch. Cap., meq/100 cm³
BS-% = Base Saturation, % of CEC
Ac = Acidity, meq/100 cm³
pH = Hydrogen-Ion Activity
P-I = Phosphorus Index
K-I = Potassium Index
Ca-% = Calcium, % of CEC
Mg-% = Magnesium, % of CEC
Mn-I = Manganese Index
Zn-I = Zinc Index
Cu-I = Copper Index
S-I = Sulfate Sulfur Index
SS-I = Soluble Salt Index
NO_3N = Nitrate N, mg/dm³
NH_4N = Ammonium N, mg/dm³
Na = Sodium, meq/100 cm³

** TREATMENT, lbs/a unless specified

LIME: T = tons/a, M = lbs./1000 sq. ft.
N = Nitrogen, M = lbs./1000 sq. ft.
P_2O_5 = Phosphate, M = lbs./1000 sq. ft.
K_2O = Potash, M = lbs./1000 sq. ft.
Mg = Magnesium
Cu = Copper
Zn = Zinc
B = Boron
Mn = Manganese

$ Test Level is questionable. See supplemental material.

READ SUPPLEMENTAL MATERIAL AND BACK OF REPORT FOR FURTHER DETAIL

SOIL TEST REPORT

AGRONOMIC DIVISION, N.C. DEPT. OF AGRICULTURE
4300 REEDY CREEK ROAD
RALEIGH, N.C. 27607-6465

PHONE: (919) 733-2655

COPIES SENT TO:
X COUNTY EXTENSION DIRECTOR

REPORT [redacted]7812

04

04/17/95

TO: NELLO L. TEER
PO BOX 4350
CARY NC 27519-

DAVID MEYER CARY

RECEIVED APR 19 1995

FARM LOCATION (COUNTY): DURHAM

SERVING N.C. CITIZENS FOR OVER 50 YEARS

SAMPLE NO. 001

FIELD INFORMATION

SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O
001						

TEST RESULTS *

SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
MIN	0.2	1.41	12.0	100	0.0	7.6	008	38	83.3	15.2	266	138	326					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4

SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE

SAMPLE NO. 002

FIELD INFORMATION

SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O
002						

TEST RESULTS *

SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
MIN	0.0	1.51	5.9	100	0.0	7.9	004	14	91.4	7.4	183	058	54					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4

SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE

SAMPLE NO. 003

FIELD INFORMATION

SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O
003						

TEST RESULTS *

SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
MIN	0.0	1.38	16.1	100	0.0	7.9	004	40	67.6	31.1	625+	052	342					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4

SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE

SAMPLE NO. 004

FIELD INFORMATION

SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O
004						

TEST RESULTS *

SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na
MIN	0.0	1.42	7.3	100	0.0	7.9	008	24	76.5	21.9	625+	107	332					

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE
LAWN	0.0	(20 LBS 5-10-10 OR EQUIV PER 1000 SQ FT)								4

SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE

SAMPLE NO.

FIELD INFORMATION

SAMPLE NO.	PREVIOUS CROP	APPLIED LIME Mo.	Yr.	T/A	FERT. LAST CROP P_2O_5	K_2O

TEST RESULTS *

SOIL CLASS	HM-%	W/V	CEC	BS-%	Ac	pH	P-I	K-I	Ca-%	Mg-%	Mn-I	Zn-I	Cu-I	S-I	SS-I	NO_3N	NH_4N	Na

SUGGESTED TREATMENT FOR FIRST CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE

SUGGESTED TREATMENT FOR SECOND CROP (OR YEAR) **

CROP TO BE GROWN	LIME	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	SEE NOTE

* TEST RESULTS (N.C. tests will not compare directly to numbers obtained by other methods.)

Soil Class: MIN = Mineral; M-O = Mineral-Organic; ORG = Organic
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BS-% = Base Saturation, % of CEC
Ac = Acidity, meq/100 cm³
pH = Hydrogen-ion Activity
P-I = Phosphorus Index
K-I = Potassium Index
Ca-% = Calcium, % of CEC
Mg-% = Magnesium, % of CEC
Mn-I = Manganese Index
Zn-I = Zinc Index
Cu-I = Copper Index
S-I = Sulfate Sulfur Index
SS-I = Soluble Salt Index
NO_3N = Nitrate N, mg/dm³
NH_4N = Ammonium N, mg/dm³
Na = Sodium, meq/100 cm³

** TREATMENT, lbs/a unless specified

LIME: T = tons/a, M = lbs./1000 sq. ft.
N = Nitrogen, M = lbs./1000 sq. ft.
P_2O_5 = Phosphate, M = lbs./1000 sq. ft.
K_2O = Potash, M = lbs./1000 sq. ft.
Mg = Magnesium
Cu = Copper
Zn = Zinc
B = Boron
Mn = Manganese

$ Test Level is questionable. See supplemental material.

READ SUPPLEMENTAL MATERIAL AND BACK OF REPORT FOR FURTHER DETAIL

Front Royal
Environmental Services, Inc.

JOB NO. 0013-941-012 SHEET 1 OF 1
JOB NAME NELLO TEER QUARRY
BY 7-10-95 DATE SLF
CHECKED BY _____ DATE _____

DETERMINE LAND AREA FOR PERMIT APPLICATION

VOLUME = 200 yd^3
CLASS II CONTAMINANTS

FROM FIGURE B p51 from GUIDELINES BOOK

GROUP A > 3.5' TO WATER TABLE
LAND APPLICATION RATE = 3"

1 yd^3 @ 3" deep = 108 ft^2

$200\ yd^3 \cdot \frac{108\ ft^2}{yd^3} = 21,600\ ft^2 \cdot \frac{1\ acre}{43,560\ ft^2} = 0.496$ acres

IF GROUP B > 3.5' TO WATER TABLE
LAND APPLICATION RATE = 2"

1 yd^3 @ 2" dap = 162 ft^2

$200\ yd^3 \cdot \frac{162\ ft^2}{yd^3} = 32,400\ ft^2 \cdot \frac{acre}{43,560\ ft^2} = 0.744$ acres

Appendix H

Front Royal

Environmental Services, Inc.

2200 Gateway Blvd. • Suite 205 • Morrisville, NC 27560
P.O. Box 4350 • Cary, NC 27519-4350
(919) 469-9795 • Fax (919) 469-3557

September 27, 1995

Ms. Colleen Sullins
North Carolina Department of Environment,
Health, and Natural Resources
Division of Environmental Management
Water Quality Section
Permits and Engineering Unit
512 North Salisbury Street
Raleigh, North Carolina 27626-0535

Re: NPDES Individual Permit Application
and Corrective Action Plan
Nello Teer Durham Quarry
Durham County, North Carolina
Ground Water Incident No. 9537
Front Royal Project 0013-94-012

Dear Ms. Sullins:

Please find enclosed three copies of the NPDES Individual Permit Application for the proposed ground water remedial system to be installed at the Nello Teer Company (Teer) Durham Quarry located at 5013 Denfield Road (State Road 1641) in Durham County, North Carolina. The permit application has been prepared by Front Royal Environmental Services, Inc. (Front Royal), on behalf of Teer. Also enclosed is the $400.00 permit application fee and the $200.00 authorization to construct fee. Three copies of the Corrective Action Plan (CAP) Addendum have been included to provide background information, current ground water laboratory analytical data, and design specifications for the remedial system.

A ground water recovery and treatment system has been proposed for the site. The system will consist of seven ground water recovery wells, an oil/water separator, a tray type stripping tower, and a liquid phase granular activated carbon system. The proposed remedial system will be located in the vicinity of the former service station at the southern edge of the property (See Figure 10 in CAP). The remedial system effluent will be discharged to a nearby storm drain, through a constructed wetlands area, to an unnamed tributary to the Eno River (See attached discharge location map). There are approximately 1,500 feet of wetlands between the discharge point and the unnamed tributary to the Eno River. The wetlands area will serve as an additional barrier between the discharge point and the Eno River.

The Teer Durham Quarry is located at the end of Denfield Road just outside the Durham City limits. The site is not served by a municipal sanitary sewer system. The closest accessible

sewer connection is located approximately 5,000 feet from the site down Denfield Road. Because the site is not connected to the city sewer system, a special use discharge permit is not an option for the remedial system discharge.

Injection wells and an infiltration gallery are not feasible options for the site due to the presence of a perched water table located in the area of contamination near the southern edge of the quarry. In addition, the soils in the area of the remedial system are fine grained clays that will not have the capacity to accept the design flow rate of 75 gallons per minute.

The most recent ground water analytical data indicate that benzene, ethylbenzene, and naphthalene have been detected above the North Carolina limits established in NCAC 2L. Low levels of toluene, xylenes, and 1,2-dichloroethane were also detected during the last sampling event. A summary of historical laboratory analytical data indicates that low levels of lead, methyl tert-butyl ether (MTBE), and dibromoethane (EDB) were detected during previous sampling events (See Tables 3 and 4 in the CAP). In August 1995 a quarterly sampling event was conducted at the site. All parameters required by the NPDES permit application, except lead and EDB, were analyzed (See Attached Table 1). The results of the sampling event indicate that benzene, ethylbenzene, MTBE, and naphthalene were detected above North Carolina 2L standards. Front Royal will collect samples to provide updated contaminant levels for lead and EDB. The analytical data from the sampling event will be forwarded to your office as soon as they are available.

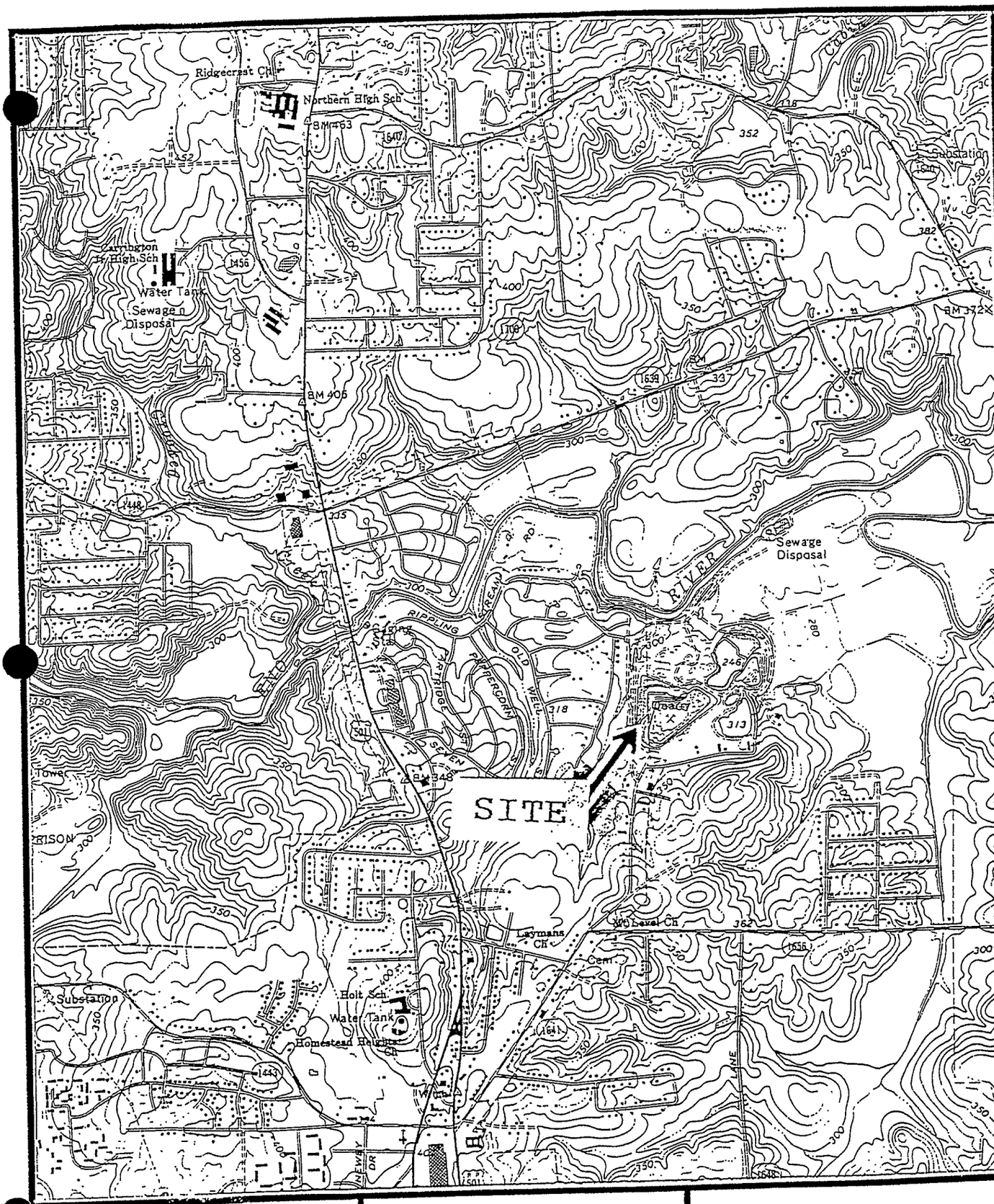
If you have any questions or require any additional information please contact me at (919) 469-9795.

Sincerely,

FRONT ROYAL ENVIRONMENTAL SERVICES, INC.

Bryan C. Gee, P.E.
Senior Project Manager

L-95-236.BCG:les
Enclosures



SITE LOCATION MAP

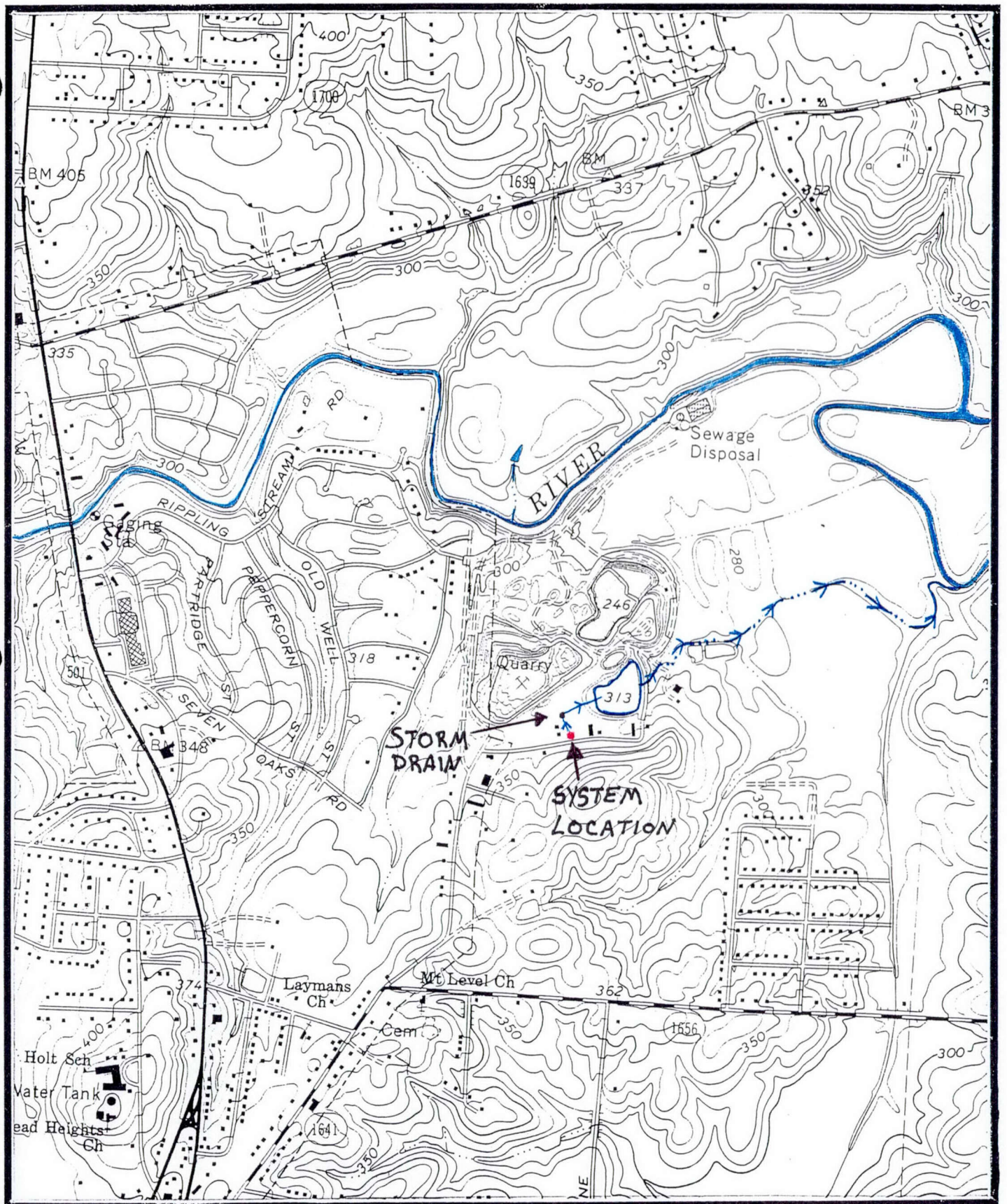
FRONT ROYAL

ENVIRONMENTAL SERVICES, INC.

FIGURE

SCALE: 1'' = 2,000'

PROJ. #0013-94-012



Remedial System Discharge Location Map

FRONT ROYAL

ENVIRONMENTAL SERVICES, INC.

FIGURE

SCALE:

PROJ. #0013-94-012

Table 1. Ground Water Laboratory Analytical Data - August 1995

Shallow Aquifer

Well Number	Parameter (µg/l)								
	Benzene	Toluene	Ethyl-Benzene	Xylenes	MTBE	Naph-thalene	1,2- dichloro ethane	Isopropyl ether	Phenol
MW-7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-14S	BDL	BDL	BDL	BDL	**507.0**	BDL	BDL	BDL	BDL
MW-15S	BDL	BDL	**77.7**	205.0	BDL	**27.6**	BDL	BDL	BDL
MW-17	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-18	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-20S	**64.4**	26.0	25.3	80.7	9.7	BDL	BDL	50.0	BDL
MW-25	BDL	336.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-26	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NCAC 2L Standard	1.0	1,000.0	29.0	530.0	200.0	21.0	0.38		300.0

All units in micrograms per liter (µg/l)
Bold indicates contaminant level in excess of NCAC 2L Standard
Analysis performed by Hydrologic, Inc.
BDL - Below method detection limits

Front Royal Project 0013-94-012
NPDES-1.wk4

Table 1. Ground Water Laboratory Analytical Data - August 1995

Deep Aquifer

Well Number	Parameter (µg/l)								
	Benzene	Toluene	Ethyl-Benzene	Xylenes	MTBE	Naph-thalene	1,2- dichloro ethane	Isopropyl ether	Phenol
MW-1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-11	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-13	**1.1**	2.8	BDL	2.6	BDL	BDL	BDL	23.1	BDL
MW-15I	**2.2**	BDL	BDL	BDL	44.6	BDL	BDL	5.7	BDL
MW-20D	**30.0**	BDL	BDL	BDL	BDL	BDL	BDL	26.6	BDL
MW-22	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-23	**58.9**	18.6	**30.7**	77.3	BDL	19.1	BDL	BDL	BDL
NCAC 2L Standard	1.0	1,000.0	29.0	530.0	200.0	21.0	0.38		300.0

All units in micrograms per liter (µg/l)
Bold indicates contaminant level in excess of NCAC 2L Standard
Analysis performed by Hydrologic, Inc.
BDL - Below method detection limits

Front Royal Project 0013-94-012
NPDES-1.wk4

North Carolina Dept. of Environment, Health, and Natural Resources
Division of Environmental Management, P.O. Box 29535, Raleigh, NC 27626-0535

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
APPLICATION FOR PERMIT DISCHARGE SHORT FORM C-GW

APPLICATION NUMBER
Date Received
Year / Month / Day

(DEM USE ONLY)

To be filed by persons engaged in groundwater remediation projects.

Do not attempt to complete this form before reading accompanying instructions.

(Please print or type)

1. Name, address, location, and telephone number of facility producing discharge
   A. Name Nello L. Teer Company - Durham Quarry
   B. Mailing address Post Office Box 13983
      1. Street address
      2. City Research Triangle Park 3. State North Carolina
      4. ZIP 27709-3983
   C. Location:
      1. Street 5013 Denfield Road (State Road 1641)
      2. City Durham 3. State North Carolina
      4. County Durham
   D. Telephone No. (919)- 477-7307
   E. Nature of business Rock Quarry

2. Facility contact
   A. Name Steven S. Edgerton
   B. Title Environmental Manager C. Telephone No. (919) - 380-2519

3. The application is for [X] a new permit, [ ] permit renewal, [ ] permit modification.
   SIC 1 4 2 9 (if known). If application is for renewal or modification, please indicate permit number: NC00

4. Product(s) recovered free phase gasoline, dissolved diesel fuel, gasoline, solvents
   [Diesel fuel, leaded or unleaded fuel, solvents, etc.]

This application must also include the following:

A) A report of alternatives to surface water discharge as outlined by N.C. Permit and Engineering Unit's "Guidance for Evaluation of Wastewater Disposal Alternatives." [Required by 15A NCAC 2H .0105 (c)].

B) An engineering proposal detailing the remediation project. [Required by 15A NCAC 2H .0105 (c)].

C) A listing of any chemicals found in detectable amounts with the maximum observed concentration reported. The summary of analytical results containing this maximum value should also be submitted (i.e. the listing, not the graphical scan). The most recent sample must be no older than one year previous to the date of this application.

For fuel remediation projects, volatile organic compounds should be scanned along with any suspected fuel additives. The following compounds should be included: benzene*, toluene*, ethylbenzene*, xylene*, lead , methyl tert-butylether (MTBE), dibromoethane (EDB), 1,2-dichloroethane, isopropyl ether, naphthalene, phenol.

* An EPA approved method capable of detection levels to 1 ppb should be used to detect these compounds

For solvents or unidentified products, an EPA Method 624/625 analysis should be provided, with the 10 largest peaks, not identified as one of the targeted compounds and not present in the procedural blank, identified and approximately quantitated. [As per the same guidance stipulated on NCDEM's "Annual Pollutant Analysis Monitoring (APAM) Requirement - Reporting Form A," Revised June 1990].
If metals or pesticides are suspected to be present, these should be analyzed to the same detection level as presented in the NC APAM.

D) The removal efficiency of each compound detected for the proposed project should be provided, if known.

5. Name of receiving water Eno River
Attach a USGS topographical map with all discharge points clearly marked.

6. Is potential discharge directly to the receiving water? If not, state specifically the discharge point.
No, discharge is to onsite storm sewer that flows to manmade onsite wetlands then to the Eno.
Mark clearly the pathway to the potential receiving water on the site map. [This includes tracing the pathway of the storm sewer to its discharge point, if a storm sewer is the only viable means of discharge.]

7. Amount of treated groundwater to be discharged in gallons per operating day:
Design flow 108,000gpd 75gpm

8. Describe the duration and frequency of the discharge (continuous, intermittent, seasonal) including the months of discharge, number of days per week of discharge, volume treated (monthly average flow in gallons per day).
Continuous flow, 24 hours/day 7 days/week
Monthly average flow 108,000gpd

I certify that I am familiar with the information contained in the application and that to the best of my knowledge and belief such information is true, complete, and accurate.

Steven S. Edgerton — PRINTED Name of Person Signing

Environmental Manager — Title

Steven S. Edgerton — SIGNATURE of Applicant

9/26/95 — Date Application Signed

North Carolina General Statute 143-215.6 (b) (2) provides that:

Any person who knowingly makes any false statement representation, or certification in any application, record, report, plan or other document files or required to be maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, or who falsifies, tampers with or knowingly renders inaccurate any recording or monitoring device or method required to be operated or maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, shall be guilty of a misdemeanor punishable by a fine not to exceed $10,000, or by imprisonment not to exceed six months, or by both. (18 U.S.C. Section 1001 provides a punishment by a fine of not more than $10,000 or imprisonment not more than 5 years, or both, for a similar offense.)

Front Royal
Environmental Services, Inc.

JOB NO. 0013-94-012 SHEET 1 OF 1
JOB NAME NELLO TEER - App. H
BY SLF DATE 7/30/95
CHECKED BY _____ DATE _____

Influent characteristics based on worst case data collected during April 1994 sampling event. Estimated effluent standards based on NPDES General permit effluent limits for benzene and toluene and 15A NCAC 2L standards for other constituents ASSUME CONTAMINANTS STRIPPED ARE DISCHARGED TO ATMOSPHERE.

	Influent	Effluent
Benzene	95.0	71.4
Ethylbenzene	62.0	29.0
Toluene	19.0	11.0
Xylenes	188.0	530.0
Naphthalene	54.0	21.0
Chloroform	102.0	0.19
1,1 - Dichloroethane	632.0	700.0
1,1 - Dichloroethylene	708.0	7.0
Trichloroethylene	267.0	28.0
1,1,1 Trichloroethane	2,709.0	200.0
c,1,2 - Dichloroethylene	319.0	70.0
MTBE	105.0	1.0

BASED ON EFFICIENCY DATA FROM STRIPPING TOWER MANUFACTURER AIR DISCHARGE WILL BE:

	DISCHARGE IN LBS/hr
Benzene	3.57×10^{-3}
Ethylbenzene	2.33×10^{-3}
Toluene	7.13×10^{-4}
Xylenes	7.06×10^{-3}
Naphthalene	1.85×10^{-3}
Chloroform	3.83×10^{-3}
1,1 - Dichloroethane	2.37×10^{-2}
1,1 - Dichloroethylene	2.66×10^{-2}
Trichloroethylene	1×10^{-2}
1,1,1 - Trichloroethane	1.02×10^{-1}
CIS 1,2 Dichloroethylene	1.20×10^{-2}
MTBE	7.97×10^{-5}

TOTAL 0.19373 lb/hr $\times$ 24 hr/day = 4.65 lb/day

4.65 lb/day $\times$ 365 day/year = 1,697 lb/year

Front Royal

Environmental Services, Inc.

2200 Gateway Blvd. • Suite 205 • Morrisville, NC 27560
P.O. Box 4350 • Cary, NC 27519-4350
(919) 469-9795 • Fax (919) 469-3557

VIA CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 27, 1995

Dr. John Fletcher, Director
Durham County Health Department
414 East Main Street
Durham, North Carolina 27701

Re: Notice Concerning the Request for
a Corrective Action Plan
Nello Teer Durham Quarry
Denfield Street
Durham, North Carolina
Front Royal Project No. 0013-94-012

Dear Dr. Fletcher:

This letter is to inform you that a request has been submitted to the North Carolina Division of Environmental Management (NCDEM) for approval of an environmental remedial action in your area. In accordance with the North Carolina General Statutes, a set of Ground Water Classifications and Standards has been put in place for the protection of all ground waters across the state. Because of your position with Durham County, the law requires that you be informed of the proposed activities.

Pursuant to the notification requirements of Title 15A NCAC 2L .0114 (a), Front Royal Environmental Services, Inc. (Front Royal), on behalf of the Nello Teer Company (Teer), is providing notice of the request for a corrective action plan under 15A NCAC 2L .0106 (c). This property is located at the end of Denfield Street in Durham County, North Carolina.

Some of the constituents found in the ground water and soils at the referenced location are typical of gasoline and oil, and have been detected in the ground water in concentrations which exceed the Ground Water Quality Standards outlined in 15A NCAC 2L .0202. The contaminants detected at the site are most likely the result of an accidental spill or overfill of the underground storage tanks that were in use at an onsite service station. In addition, some chlorinated solvent contaminants have been detected in the vicinity of the former asphalt plant that was located along the southern perimeter of the quarry pit.

The USTs were removed from the site in December 1988. The onsite service station is no longer in use, and the asphalt plant has been torn down. During the course of the site investigations, thirty two monitor wells were installed at the site. The most recent ground water elevation data collected by Front Royal indicate that there are two aquifers at the site. The surface of the shallow aquifer ranges between 5 and 10 feet and the deep aquifer is located between 20 and 25 feet. The ground water flow in the shallow aquifer is toward the east, while the ground water flow in the deep aquifer is toward the north/northwest. Laboratory analytical data from ground water sampling events indicate that the highest levels of petroleum contaminants are located in the vicinity of the former UST bed area.

Soil laboratory analytical data indicate that elevated levels of total petroleum hydrocarbons as diesel have been detected in the soils in the vicinity of the former service station. In addition, elevated contaminant levels were detected in the top layer of soils in the vicinity of the former asphalt plant.

On behalf of Teer, Front Royal has proposed that a corrective action system be installed to recover and treat impacted ground water and soils. Seven ground water recovery wells will be installed in the vicinity of the former service station and the asphalt plant. Recovered ground water will be treated using an oil/water separator, a tray type stripping tower, and liquid phase granular activated carbon. In addition, two soil vacuum extraction systems will be installed to help remediate soil contamination onsite.

During the site investigations, approximately 200 cubic yards of contaminated soils were excavated from the area of the former asphalt plant. These soils have been temporarily staged onsite on plastic. Teer has proposed that the soils be land applied to a 0.5 acre area along the southern perimeter of the quarry pit. A soil land application permit has been filed with the Raleigh Regional Office of the North Carolina Department of Environment, Health, and Natural Resources - Division of Environmental Management (NCDEM).

The goals of the corrective action are as follows:

- to reduce, prevent, and/or mitigate further migration of contaminants to non-impacted areas
- to reduce or eliminate any risk to the public health and well-being
- and, to remove and/or reduce soil and groundwater contaminants to levels established in the North Carolina Ground Water Classification Standards, or to levels that can be demonstrated as the best obtainable using economically and technically feasible remediation methods, or to any levels that may be established or accepted and mutually agreed upon by NCDEM and Teer under a consent order, special order, or other agreement.

Any written comments concerning this request should be submitted within 30 days of September 27, 1995 to Mr. Robert Walton of the Raleigh Regional Office of the NCDEM. In addition, the Raleigh Regional Office has the proposed Corrective Action Plan for the referenced site with detailed site information on record for public perusal. You may make copies of the information at a charge of 10 cents per page.

Please send written comments and requests to examine the proposed Corrective Action Plan to the following address:

Mr. Robert Walton
North Carolina Division of Environmental Management
Raleigh Regional Office
3800 Barrett Drive, Suite 101
Raleigh, North Carolina 27609
(919) 571-4700

Raleigh Regional Office staff may be contacted during normal weekday business hours to answer questions pertaining to this request. Notification of this request for corrective action is also being made by certified mail to the Durham County Manager.

If you have any questions regarding this matter please contact me at (919) 469-9795.

Sincerely,

FRONT ROYAL ENVIRONMENTAL SERVICES, INC.

Bryan C. Gee, P.E.
Senior Project Manager

BCG:asb

Front Royal

Environmental Services, Inc.

2200 Gateway Blvd. • Suite 205 • Morrisville, NC 27560
P.O. Box 4350 • Cary, NC 27519-4350
(919) 469-9795 • Fax (919) 469-3557

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September 27, 1995

Mr. George Williams
Durham County Manager
Office of the County Manager
200 East Main Street, 2nd Floor
Durham, North Carolina 27701

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a Corrective Action Plan
Nello Teer Durham Quarry
Denfield Street
Durham, North Carolina
Front Royal Project No. 0013-94-012

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Sincerely,

FRONT ROYAL ENVIRONMENTAL SERVICES, INC.

Bryan C. Gee, P.E.
Senior Project Manager

L95-232:BCG:asb