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Ground Water Monitoring Report

Received
JUN 20
Waste
Management

April 2007 Monitoring Event

Davidson County

Construction & Demolition Debris Landfill
Lexington, North Carolina

Prepared for:
Davidson County Integrated Solid Waste
1242 Old Highway 29
Thomasville, NC 27360-0024

June 2007

Richardson Smith Gardner & Associates, Inc.
Engineering and Geological Services
14 North Boylan Avenue
Raleigh, North Carolina 27603

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Davidson County C&D Landfill

Ground Water Monitoring Report
April 2007 Monitoring Event

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1.0 Introduction

On April 18th, 2007, Environment 1, Inc. personnel performed the required semi-annual ground water monitoring event at the Davidson County C&D Landfill. This sampling event satisfies the requirements of the monitoring programs for this site. The following report summarizes the monitoring event, sampling procedures, field and laboratory results and ground water characterization as required by NC Solid Waste Regulations. Also included are summary tables of ground water measurements, field parameters, detected constituents and the laboratory analytical report.

Davidson County C&D Landfill

2.1 Sampling Procedures

Ground water sampling was performed at the four (4) ground water monitoring well locations associated with the C&D landfill. It should be noted that due to construction of Phase-2, CDMW-4 was abandoned and replaced with CDMW-4A. The surface water sampling location (SW-3) associated with this site was sampled and inadvertently reported with the Holly Grove Landfill laboratory data. Sampling procedures followed the protocols set forth in the site's Sampling and Analysis Plan and the North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities. Each well was gauged to determine ground water depth and then purged of three well volumes or until dry. The wells were purged and allowed to stabilize prior to sample collection. Ground water purging and sample collection was performed using a factory sealed Teflon™ bailer.

Field measurements of temperature, pH, and conductivity were taken at each well. Samples were collected in laboratory containers provided by Environment 1, Inc. (NC Laboratory Certification # 10). Upon collection, the samples were sealed, placed on ice, and transported via overnight delivery to the laboratory. Field blanks were also collected for quality control purposes.

During the sampling process, each well was inspected for signs of damage or unusual conditions. All wells were found to be in good condition and free of obstructions.

2.2 Field and Laboratory Results

Ground water samples were collected from the four monitoring wells (CDMW-2, CDMW-3, CDMW-4 and CDMW-5) located down gradient of the C&D Landfill. Analysis of these samples indicated detectable levels of barium and chromium only. Neither of these constituents was detected of levels above the ground water standards. The laboratory report is included in **Appendix A**.

3.0 Site Ground Water Characterization

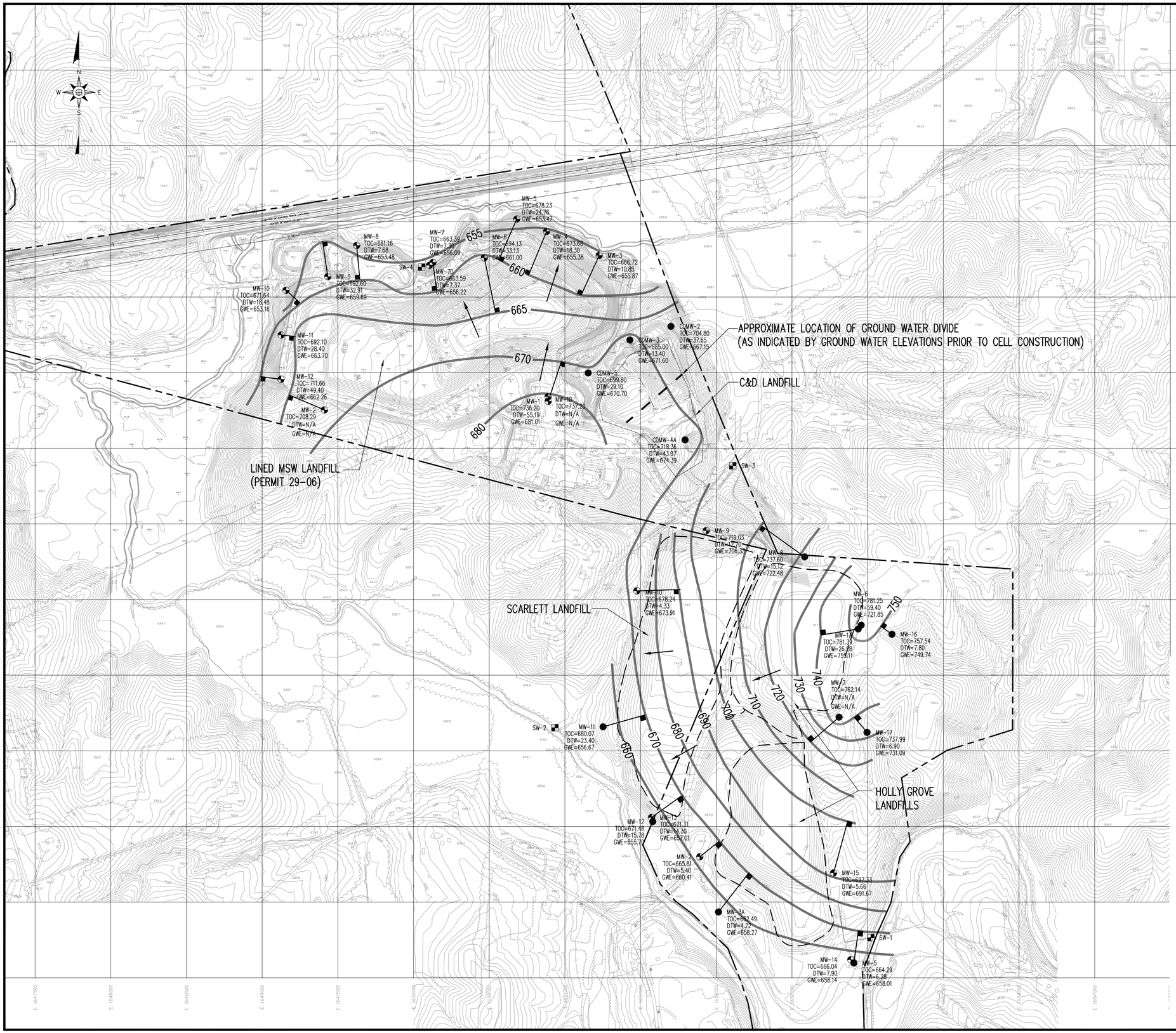
A potentiometric surface map was prepared for the entire site from ground water elevation data collected during this sampling event.

Ground water at the C&D landfill is migrating both to the north, west and south with a ground water divide located at the site. The ground water divide was made evident during site permitting when more piezometers were located in the area. The site topography also indicates a likely ground water divide across this site. The ground water to the north of the divide is likely influenced by the presence of the sedimentation basin adjacent to Phase 1. The potentiometric surface for the C&D landfill is shown on **Figure 1**.

4.0 Conclusions

The results presented above from the C&D landfill indicate detectable levels of two inorganic constituents. These are likely due to sediments in the sample and are not indicative of ground water impact from the site.

Figures



LEGEND

MW-1A	PREVIOUSLY INSTALLED MONITORING WELL
MW-5	BEDROCK MONITORING WELL
SW-1	EXISTING SURFACE WATER MONITORING STATION
	GROUND WATER SURFACE COUNTOUR
	DIRECTION OF GROUNDWATER FLOW
	PROPERTY LINE
	WASTE BOUNDARY
	MEASUREMENT FOR HYDRAULIC GRADIENT CALCULATION

NOTE:

1. GROUND WATER DATA RECORDED ON APRIL 18, 2007 BY RSG PERSONNEL.

0 300' 600' 900'

NO.	DATE	REVISION

RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services
14 N. Boylan Ave.
Raleigh, N.C. 27603
www.rsgengineers.com
ph: 919-828-0577
fax: 919-828-3899

SEAL

SEAL

PROJECT TITLE: DAVIDSON COUNTY LANDFILLS

DRAWING TITLE: POTENTIOMETRIC SURFACE MAP
LINED LANDFILL, C&D AND
HOLLY GROVE LANDFILLS
(SPRING 2007)

DESIGNED BY: J.A.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: DAVDCO-4
SCALE: AS SHOWN	DATE: JUNE 2007
FILE NAME DAVDCO-D0382	
SHEET NO.	DRAWING NO. FIG. 1

G:\CAD\Davidson\Davidco-d-sheets\DAVIDCO-D0382.dwg - 6/19/2007 10:53 AM

Tables

Table 1
Ground Water Elevations
Davidson County C&D Landfill
4/18/2007

Well	TOC Elevation (feet)	Water Level (feet)	GW Elev (feet)
CDMW-2	704.80	37.65	667.15
CDMW-3	685.00	13.40	671.60
CDMW-4A	718.36	43.97	674.39
CDMW-5	699.80	29.10	670.70

Notes

Velocity Calculated from V=K*I/n where:

V = velocity
K = Hydraulic Conductivity
I = Gradient
n = Porosity

Hydraulic Conductivity data from slug tests performed in 1994
Porosity values assumed from Groundwater & Wells (Driscoll)

Table 2
Field Parameters
Davidson County C&D Landfill
4/18/2007

Well	pH (Std Units)	Conductivity (uhmos/cm)	Temperature (Celsius)
CDMW-2	6.6	240	15.5
CDMW-3	6.1	480	15.0
CDMW-4A	7.0	600	15.0
CDMW-5	6.7	340	15.5
SW-3	7.1	460	16.0

Table 3
Detected Inorganic Parameters
Davidson County C&D Landfill
4/18/2007

Constituent	PQL	2L	CDMW-2	CDMW-3	CDMW-4A	CDMW-5
Barium	100	2000	**101**	**227**	ND	**211**
Total Chromium	10	50	ND	ND	**17**	**18**

ND = Not detected at or above PQL

Appendix A

Laboratory Analytical Report

Environment 1, Incorporated

RECD MAY 16 2007

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6050

DAVIDSON COUNTY LANDFILL (C&D)
MS. JOAN SMYTH
RICHARDSON SMITH GARDNER
14 N.BOYLAN AVENUE
RALEIGH ,NC 27603

DATE COLLECTED: 04/20/07
DATE REPORTED : 05/14/07

REVIEWED BY:

PARAMETERS	CDMW-2	CDMW-3	CDMW-4A	CDMW-5	Trip Blank	Analysis Date	Analyst	Method Code
Arsenic, ug/l	< 10	< 10	< 10	< 10		04/30/07	CMF	EPA200.8
Barium, ug/l	101	227	< 100	211		04/30/07	CMF	EPA200.8
Cadmium, ug/l	<1.0	<1.0	<1.0	<1.0		04/30/07	CMF	EPA200.8
Total Chromium, ug/l	< 10	< 10	17	18		04/30/07	CMF	EPA200.8
Lead, ug/l	< 10	< 10	< 10	< 10		04/30/07	CMF	EPA200.8
Mercury, ug/l	<0.2	<0.2	<0.2			04/30/07	CMF	EPA200.8
Mercury, ug/l				<0.2		05/08/07	ADD	EPA245.1
Selenium, ug/l	< 10	< 10	< 10	< 10		04/30/07	CMF	EPA200.8
Silver, ug/l	<10	<10	<10	<10		04/30/07	CMF	EPA200.8

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: DAVIDSON COUNTY LANDFILL (C&D)
MS. JOAN SMYTH
RICHARDSON SMITH GARDNER
14 N.BOYLAN AVENUE
RALEIGH, NC 27603

CLIENT ID: 6050

ANALYST: MAO
DATE COLLECTED: 04/20/07
DATE ANALYZED: 05/04/07
DATE REPORTED: 05/14/07

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	CDMW-2	CDMW-3	CDMW-4A	CDMW-5	Trip Blank
1. Chloromethane	<5.00	<5.00	<5.00	<5.00	<5.00
2. Vinyl Chloride	<5.00	<5.00	<5.00	<5.00	<5.00
3. Bromomethane	<10.00	<10.00	<10.00	<10.00	<10.00
4. Chloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
5. Trichlorofluoromethane	<5.00	<5.00	<5.00	<5.00	<5.00
6. 1,1-Dichloroethene	<5.00	<5.00	<5.00	<5.00	<5.00
7. Acetone	<100.00	<100.00	<100.00	<100.00	<100.00
8. Iodomethane	<10.00	<10.00	<10.00	<10.00	<10.00
9. Carbon Disulfide	<100.00	<100.00	<100.00	<100.00	<100.00
10. Methylene Chloride	<5.00	<5.00	<5.00	<5.00	<5.00
11. trans-1,2-Dichloroethene	<5.00	<5.00	<5.00	<5.00	<5.00
12. 1,1-Dichloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
13. Vinyl Acetate	<50.00	<50.00	<50.00	<50.00	<50.00
14. Cis-1,2-Dichloroethene	<5.00	<5.00	<5.00	<5.00	<5.00
15. 2-Butanone	<100.00	<100.00	<100.00	<100.00	<100.00
16. Bromochloromethane	<3.00	<3.00	<3.00	<3.00	<3.00
17. Chloroform	<5.00	<5.00	<5.00	<5.00	<5.00
18. 1,1,1-Trichloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
19. Carbon Tetrachloride	<5.00	<5.00	<5.00	<5.00	<5.00
20. Benzene	<3.00	<3.00	<3.00	<3.00	<3.00
21. 1,2-Dichloroethane	<3.00	<3.00	<3.00	<3.00	<3.00
22. Trichloroethene	<3.00	<3.00	<3.00	<3.00	<3.00
23. 1,2-Dichloropropane	<3.00	<3.00	<3.00	<3.00	<3.00
24. Bromodichloromethane	<3.00	<3.00	<3.00	<3.00	<3.00
25. Cis-1,3-Dichloropropene	<5.00	<5.00	<5.00	<5.00	<5.00
26. 4-Methyl-2-Pentanone	<100.00	<100.00	<100.00	<100.00	<100.00
27. Toluene	<5.00	<5.00	<5.00	<5.00	<5.00
28. trans-1,3-Dichloropropene	<5.00	<5.00	<5.00	<5.00	<5.00
29. 1,1,2-Trichloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
30. Tetrachloroethene	<3.00	<3.00	<3.00	<3.00	<3.00
31. 2-Hexanone	<50.00	<50.00	<50.00	<50.00	<50.00
32. Dibromochloromethane	<3.00	<3.00	<3.00	<3.00	<3.00
33. 1,2-Dibromoethane	<3.00	<3.00	<3.00	<3.00	<3.00
34. Chlorobenzene	<3.00	<3.00	<3.00	<3.00	<3.00
35. 1,1,1,2-Tetrachloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
36. Ethylbenzene	<5.00	<5.00	<5.00	<5.00	<5.00
37. Xylenes	<4.00	<4.00	<4.00	<4.00	<4.00
38. Dibromomethane	<10.00	<10.00	<10.00	<10.00	<10.00
39. Styrene	<10.00	<10.00	<10.00	<10.00	<10.00
40. Bromoform	<3.00	<3.00	<3.00	<3.00	<3.00
41. 1,1,2,2-Tetrachloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
42. 1,2,3-Trichloropropane	<8.00	<8.00	<8.00	<8.00	<8.00
43. 1,4-Dichlorobenzene	<3.00	<3.00	<3.00	<3.00	<3.00
44. 1,2-Dichlorobenzene	<5.00	<5.00	<5.00	<5.00	<5.00
45. 1,2-Dibromo-3-Chloropropane	<13.00	<13.00	<13.00	<13.00	<13.00
46. Acrylonitrile	<200.00	<200.00	<200.00	<200.00	<200.00
47. trans-1,4-Dichloro-2-Butene	<100.00	<100.00	<100.00	<100.00	<100.00

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6050 **Week:** 11

DAVIDSON COUNTY LANDFILL (C&D)
MS. JOAN SMYTH
RICHARDSON SMITH GARDNER
14 N.BOYLAN AVENUE
RALEIGH NC 27603

(919) 828-0577

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION																			
pH CHECK (LAB)			L2	L2	L2	L2													
CONTAINER TYPE, P/G			P	G	G	G													
CHEMICAL PRESERVATION			B	E	E	E													
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Metals	EPA 8260B	8260 Dup. 1	8260 Dup. 2										
CDMW-2	4-20-07	11:30			4														
CDMW-3	↓	11:45			3														
CDMW-4A	↓	12:30			3														
CDMW-5	↓	12:00			3														
Trip Blank					2														

PARAMETERS

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY: Y N

SAMPLES COLLECTED BY: (Please Print)

SAMPLES RECEIVED IN LAB AT 6.0 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Nicholas Mulkerin	4-23-07 4:30	[signature]	4/24/07 X.Dias
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

Instructions for completing this form are on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

№ 151354