Technical Memorandum

To:	Joan Taylor & Cynthia Gianfrancesco, RIDEM
From:	Ed Summerly and Richard Carlone, GZA
CC:	Michael Healey, Chabert Division of NFA Corporation Mary Morgan, Richmond Town Hall Clark Memorial Library, Charbert Repository
File No:	32795.12
Date:	November 26, 2007
Re:	Summary of Surface Water Data Charbert Manufacturing Facility Alton, Rhode Island

The purpose of this technical memorandum is to respond to the Rhode Island Department of Environmental Managements (RIDEM's) request of October 16, 2007 to provide a summary of surface water data, collected as part of the ongoing environmental work at Charbert, from the Wood and Pawcatuck Rivers. In addition, this memorandum provides a brief summary of passive diffusion bag sampling methodology as it was applied by GZA to sampling groundwater discharge to the Wood River.

Samples were taken from the Wood and Pawcatuck Rivers adjacent to and in the vicinity of the Charbert Facility. Summaries from two sampling events, one in December 2004 and one in September 2005, are attached as Tables 1 and 2. Laboratory certificates for the September 2005 sampling event are attached for your use. Due to the volume of material, the December 2004 laboratory certificates are not attached and are available upon request.

Diffusion Bag Sampling

The following is a brief description of the passive diffusion bag sampling methodology. Please refer to the following two references for a more comprehensive description of the sampling methodology.

- "Distribution of Selected Volatile Organic Compounds Determined with Water to Vapor Diffusion Samplers at the Interface between Ground Water and Surface Water", Centredale Manor Site, North Providence, Rhode Island, September 1999-OFR 00-276. (United States Geological Survey Document prepared in cooperation with the Environmental Protection Agency). Church and others.
- "User's Guide for Polyethylene-Based Passive Diffusion Bag Samplers to Obtain Volatile Organic Compound Concentrations in Wells". U.S. Geological Survey, Water-Resources Investigation Report 01-4060, 2001. Vroblesky, Don A.

Passive diffusion bag samplers are low density polyethylene (LDPE) bags filled with deionized water. When a passive diffusion bag is placed in a well or buried in a river bottom (as was done at Charbert), volatile organic compounds (VOCs), excluding certain ketones, ethers, and alcohols diffuse through the semi-permeable LDPE bag. An equilibrium then forms between the VOC concentration in the water outside and inside the bag. Generally, a minimum of two weeks is required for the equilibrium to form. The bags are then retrieved and analyzed. The bags GZA deployed in the bed of the Wood River adjacent to Charbert were deployed for 3 weeks.

As noted in the above references, analytical results from diffusion bag samplers buried in a river bottom are indicative of pore water quality (groundwater seeping into the river) not surface water quality. Dilution, volatilization and other attenuation mechanisms greatly reduce the concentration of constituents detected in the river from that observed in pore water.

Table 1
Surface Water Data Summary-December 2004
Charbert, Division of NFA
Alton, Rhode Island
Job# 32795.12

PARAMETERS	UNITS	GZA Station 1: Wood River 100 ft Downstream of Church Street Dam 12/16/2004		GZA Station 2: Pawcatuck River 300 ft Upstream of Confluence with Wood River 12/16/2004		GZA Station 3: Wood River 400 ft Upstream of Confluence with Pawcatuck River 12/16/2004		GZA Station 4: Pawcatuck River 400 ft Upstream of Burdickville Road Crossing 12/16/2004	
		Result	Limit	Result	Limit	Result	Limit	Result	Limit
FIELD MEASURED PARAMETERS									
pH (SU)	SU	5.1	----	5.0	----	5.2	----	5.0	----
Specific Conductance (uS/cm)	uS/cm	79	---	70	---	81	---	90	---
Dissolved Oxygen (mg/L)	mg/L	14.1	---	12.1	---	12.7	---	12.7	---
Temperature (C)	C	1.9	---	1.7	---	2.0	---	1.6	---
Dissolved Oxygen Saturated (at measured Temp.)	mg/L	13.9	----	14.0	---	13.8	---	14.0	---
WATER QUALITY PARAMETERS									
Turbidity (NTU)	NTU	0.8		1.0		0.9		1.1	
Calcium (mg/L)	mg/L	3.2		3.3		3.3		3.4	
Magnesium (mg/L)	mg/L	0.96		1.3		1.0		1.2	
Hardness (mg/L as CaCO3)	mg/L as CaCO3	12		14		12		13	
TOTAL RECOVERABLE METALS									
Cadmium	ug/L	0.024	0.019	0.035	0.019	0.025	0.019	0.035	0.019
Chromium	ug/L	0.14	0.24	0.8	0.24	0.2	0.24	0.54	0.24
Copper	ug/L	0.340	0.4	0.720	0.4	0.41	0.4	0.54	0.4
Lead	ug/L	0.245	0.092	0.525	0.092	0.398	0.092	0.404	0.092
Nickel	ug/L	0.181	0.4	0.215	0.4	0.193	0.4	0.215	0.4
Zinc	ug/L	3.750	0.22	6.200	0.22	4.16	0.22	5.04	0.22
DISSOLVED METALS									
Cadmium	ug/L	0.010	0.011	0.015	0.011	0.013	0.011	0.02	0.011
Chromium	ug/L	0.140	0.13	0.500	0.13	0.07	0.13	0.3000	0.13
Copper	ug/L	0.220	0.08	0.400	0.08	0.28	0.08	0.3600	0.08
Lead	ug/L	0.072	0.013	0.182	0.013	0.139	0.013	0.2040	0.013
Nickel	ug/L	-0.025	0.07	0.030	0.07	0.005	0.07	0.002	0.07
Zinc	ug/L	3.39	0.48	5.77	0.48	3.81	0.48	4.85	0.48

Note 1: ND-Not Detected
Note 2: Water quality parameter analysis performed by Rhode Island Analytical Laboratories
Note 3: Metals analysis performed by Microinorganics, Inc

Table 2
Surface Water Data Summary-September 2005
Charbert, Division of NFA
Alton, Rhode Island
Job# 32795.12

PARAMETERS	UNITS	SW-1: Wood River Downstream of Lagoon 5 09/02/2005		PD-2: Wood River 35 ft South of Church Street Bridge 09/02/2005	
		Result	Limit	Result	Limit
FIELD MEASURED PARAMETERS					
pH	SU	6.1	---	6.6	---
Conductivity	mS/m	18.9	---	17.7	---
Dissolved Oxygen	mg/L	8.45	---	8.27	---
Temperature	C	23.41	---	23.49	---
Salinity	%	0.01	---	0.01	---
Total Dissolved Solids	g/L	0.123	---	0.115	---
ORP	mV	107	---	110	---
WATER QUALITY PARAMETERS					
Chemical Oxygen Demand	mg/L	8.6	4	9	4
TOTAL PETROLEUM HYDROCARBONS					
TPH	ug/L	ND	80	ND	80
VOLATILE ORGANIC COMPOUNDS					
(Only Detected Parameters Noted)					
cis-1,2-Dichloroethene		1	1	ND	1
TOTAL METALS					
Antimony	mg/L	ND	0.1	ND	0.1
Arsenic	mg/L	ND	0.1	ND	0.1
Beryllium	mg/L	ND	0.001	ND	0.001
Cadmium	mg/L	ND	0.005	ND	0.005
Chromium	mg/L	ND	0.03	ND	0.03
Copper	mg/L	ND	0.05	ND	0.05
Lead	mg/L	ND	0.04	ND	0.04
Mercury	mg/L	ND	0.0005	ND	0.0005
Nickel	mg/L	ND	0.02	ND	0.02
Selenium	mg/L	ND	0.2	ND	0.2
Silver	mg/L	ND	0.02	ND	0.02
Thallium	mg/L	ND	0.1	ND	0.1
Zinc	mg/L	ND	0.02	ND	0.02
DISSOLVED METALS					
Antimony	mg/L	ND	0.1	ND	0.1
Arsenic	mg/L	ND	0.1	ND	0.1
Beryllium	mg/L	ND	0.001	ND	0.001
Cadmium	mg/L	ND	0.005	ND	0.005
Chromium	mg/L	ND	0.03	ND	0.03
Copper	mg/L	ND	0.05	ND	0.05
Lead	mg/L	ND	0.04	ND	0.04
Mercury	mg/L	ND	0.0005	ND	0.0005
Nickel	mg/L	ND	0.02	ND	0.02
Selenium	mg/L	ND	0.2	ND	0.2
Silver	mg/L	ND	0.02	ND	0.02
Thallium	mg/L	ND	0.1	ND	0.1
Zinc	mg/L	ND	0.02	ND	0.02

Note 1: ND-Not Detected
Note 2: Analysis performed by Rhode Island Analytical Laboratories

R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Attn: Mr. Ed Summerly
140 Broadway
Providence, RI 02903

Date Received: 9/2/05
Date Reported: 9/6/05
P.O. #: 34824
Work Order #: 0509-14694

DESCRIPTION: GZA FILE# 32795.02 CHARBERT FORMER LAGOON RESPONSE

Subject sample(s) has/have been analyzed by our Warwick, R.I. laboratory with the attached results.

Reference: All parameters were analyzed by U.S. EPA approved methodologies and all NELAC requirements were met. The specific methodologies are listed in the methods column of the Certificate Of Analysis.

Data qualifiers (if present) are explained in full at the end of a given sample's analytical results.

Certification #: RI-033, MA-RI015, CT-PH-0508, ME-RI015
NH-253700 A & B, USDA S-41844, NY-11726

If you have any questions regarding this work, or if we may be of further assistance, please contact us.

Approved by:

Data Reporting

enc: Chain of Custody

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 001
SAMPLE DESCRIPTION: CHARBERT SW-1
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 9/02/2005 @ 11:00

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
COD	8.6	4.0	mg/l	EPA 410.4	9/6/05	SR
TPH						
TPH GC/FID	<80	80	ug/l	SW846 8100M	9/6/05	CY
Extraction date	Extracted			SW846 3510	9/2/05	AH
Volatile Organic Compounds						
Benzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromochloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromodichloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromoform	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromomethane	<10	10	ug/l	SW-846 8260B	9/6/05	BAS
n-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
sec-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
tert-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Carbon Tetrachloride	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chloroethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
Chloroform	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chloromethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
2-Chlorotoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
4-Chlorotoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dibromochloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dibromo-3-Chloropropane	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dibromoethane(EDB)	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dibromomethane	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dichlorodifluoromethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
cis-1,2-Dichloroethene	1	1	ug/l	SW-846 8260B	9/6/05	BAS
trans-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
2,2-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloropropene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Ethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Hexachlorobutadiene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Isopropylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
p-Isopropyltoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 001
SAMPLE DESCRIPTION: CHARBERT SW-1
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 9/02/2005 @ 11:00

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
Methylene Chloride	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
Naphthalene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
n-Propylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Styrene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,1,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Tetrachloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Toluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,3-Trichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,4-Trichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Trichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Trichlorofluoromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,3-Trichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,4-Trimethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3,5-Trimethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Vinyl Chloride	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
o-Xylene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
m&p-Xylene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
MTBE	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
SURROGATES			RANGE	SW-846 8260B	9/6/05	BAS
Dibromofluoromethane	103		86-118%	SW-846 8260B	9/6/05	BAS
Toluene-d8	102		88-110%	SW-846 8260B	9/6/05	BAS
4-Bromofluorobenzene	100		86-115%	SW-846 8260B	9/6/05	BAS
1,2 Dichloroethane-d4	112		80-120%	SW-846 8260B	9/6/05	BAS
TOTAL METALS						
ANTIMONY	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
ARSENIC	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
BERYLLIUM	<0.001	0.001	mg/l	EPA 200.7	9/6/05	JNB
CADMIUM	<0.005	0.005	mg/l	EPA 200.7	9/6/05	JNB
CHROMIUM	<0.03	0.03	mg/l	EPA 200.7	9/6/05	JNB
COPPER	<0.05	0.05	mg/l	EPA 200.7	9/6/05	JNB
LEAD	<0.04	0.04	mg/l	EPA 200.7	9/6/05	JNB
MERCURY	<0.0005	0.0005	mg/l	EPA 245.1	9/6/05	NR
NICKEL	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
SELENIUM	<0.2	0.2	mg/l	EPA 200.7	9/6/05	JNB
SILVER	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
THALLIUM	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
ZINC	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
DISSOLVED METALS						
ANTIMONY	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 001
SAMPLE DESCRIPTION: CHARBERT SW-1
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 9/02/2005 @ 11:00

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
ARSENIC	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
BERYLLIUM	<0.001	0.001	mg/l	EPA 200.7	9/6/05	JNB
CADMIUM	<0.005	0.005	mg/l	EPA 200.7	9/6/05	JNB
CHROMIUM	<0.03	0.03	mg/l	EPA 200.7	9/6/05	JNB
COPPER	<0.05	0.05	mg/l	EPA 200.7	9/6/05	JNB
LEAD	<0.04	0.04	mg/l	EPA 200.7	9/6/05	JNB
MERCURY	<0.0005	0.0005	mg/l	EPA 245.1	9/6/05	NR
NICKEL	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
SELENIUM	<0.2	0.2	mg/l	EPA 200.7	9/6/05	JNB
SILVER	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
THALLIUM	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
ZINC	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 002
SAMPLE DESCRIPTION: CHARBERT PD-2
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 9/02/2005 @ 11:30

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
COD	9.0	4.0	mg/l	EPA 410.4	9/6/05	SR
TPH						
TPH GC/FID	<80	80	ug/l	SW846 8100M	9/6/05	CY
Extraction date	Extracted			SW846 3510	9/2/05	AH
Volatile Organic Compounds						
Benzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromochloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromodichloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromoform	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromomethane	<10	10	ug/l	SW-846 8260B	9/6/05	BAS
n-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
sec-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
tert-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Carbon Tetrachloride	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chloroethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
Chloroform	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chloromethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
2-Chlorotoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
4-Chlorotoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dibromochloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dibromo-3-Chloropropane	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dibromoethane(EDB)	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dibromomethane	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dichlorodifluoromethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
cis-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
trans-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
2,2-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloropropene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Ethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Hexachlorobutadiene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Isopropylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
p-Isopropyltoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 002
SAMPLE DESCRIPTION: CHARBERT PD-2
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 9/02/2005 @ 11:30

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
Methylene Chloride	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
Naphthalene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
n-Propylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Styrene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,1,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Tetrachloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Toluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,3-Trichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,4-Trichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Trichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Trichlorofluoromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,3-Trichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,4-Trimethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3,5-Trimethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Vinyl Chloride	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
o-Xylene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
m&p-Xylene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
MTBE	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
SURROGATES			RANGE	SW-846 8260B	9/6/05	BAS
Dibromofluoromethane	106		86-118%	SW-846 8260B	9/6/05	BAS
Toluene-d8	99		88-110%	SW-846 8260B	9/6/05	BAS
4-Bromofluorobenzene	101		86-115%	SW-846 8260B	9/6/05	BAS
1,2 Dichloroethane-d4	109		80-120%	SW-846 8260B	9/6/05	BAS
TOTAL METALS						
ANTIMONY	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
ARSENIC	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
BERYLLIUM	<0.001	0.001	mg/l	EPA 200.7	9/6/05	JNB
CADMIUM	<0.005	0.005	mg/l	EPA 200.7	9/6/05	JNB
CHROMIUM	<0.03	0.03	mg/l	EPA 200.7	9/6/05	JNB
COPPER	<0.05	0.05	mg/l	EPA 200.7	9/6/05	JNB
LEAD	<0.04	0.04	mg/l	EPA 200.7	9/6/05	JNB
MERCURY	<0.0005	0.0005	mg/l	EPA 245.1	9/6/05	NR
NICKEL	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
SELENIUM	<0.2	0.2	mg/l	EPA 200.7	9/6/05	JNB
SILVER	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
THALLIUM	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
ZINC	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
DISSOLVED METALS						
ANTIMONY	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 002
SAMPLE DESCRIPTION: CHARBERT PD-2
SAMPLE TYPE: GRAB
SAMPLE DATE/TIME: 9/02/2005 @ 11:30

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
ARSENIC	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
BERYLLIUM	<0.001	0.001	mg/l	EPA 200.7	9/6/05	JNB
CADMIUM	<0.005	0.005	mg/l	EPA 200.7	9/6/05	JNB
CHROMIUM	<0.03	0.03	mg/l	EPA 200.7	9/6/05	JNB
COPPER	<0.05	0.05	mg/l	EPA 200.7	9/6/05	JNB
LEAD	<0.04	0.04	mg/l	EPA 200.7	9/6/05	JNB
MERCURY	<0.0005	0.0005	mg/l	EPA 245.1	9/6/05	NR
NICKEL	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
SELENIUM	<0.2	0.2	mg/l	EPA 200.7	9/6/05	JNB
SILVER	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB
THALLIUM	<0.1	0.1	mg/l	EPA 200.7	9/6/05	JNB
ZINC	<0.02	0.02	mg/l	EPA 200.7	9/6/05	JNB

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 005
SAMPLE DESCRIPTION: TRIP BLANK
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 9/02/2005

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
Volatile Organic Compounds						
Benzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromochloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromodichloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromoform	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Bromomethane	<10	10	ug/l	SW-846 8260B	9/6/05	BAS
n-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
sec-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
tert-Butylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Carbon Tetrachloride	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chloroethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
Chloroform	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Chloromethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
2-Chlorotoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
4-Chlorotoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dibromochloromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dibromo-3-Chloropropane	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dibromoethane(EDB)	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dibromomethane	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Dichlorodifluoromethane	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
cis-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
trans-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
2,2-Dichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1-Dichloropropene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Ethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Hexachlorobutadiene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Isopropylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
p-Isopropyltoluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Methylene Chloride	<5	5	ug/l	SW-846 8260B	9/6/05	BAS
Naphthalene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
n-Propylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Styrene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,1,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

GZA / Geoenvironmental, Inc.
Date Received: 9/2/05
Work Order #: 0509-14694

Approved by: _____
Data Reporting

Sample #: 005
SAMPLE DESCRIPTION: TRIP BLANK
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 9/02/2005

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED	ANALYST
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Tetrachloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Toluene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,3-Trichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,4-Trichlorobenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Trichloroethene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Trichlorofluoromethane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,3-Trichloropropane	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,2,4-Trimethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
1,3,5-Trimethylbenzene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
Vinyl Chloride	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
o-Xylene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
m&p-Xylene	<1	1	ug/l	SW-846 8260B	9/6/05	BAS
MTBE	<2	2	ug/l	SW-846 8260B	9/6/05	BAS
SURROGATES			RANGE	SW-846 8260B	9/6/05	BAS
Dibromofluoromethane	104		86-118%	SW-846 8260B	9/6/05	BAS
Toluene-d8	98		88-110%	SW-846 8260B	9/6/05	BAS
4-Bromofluorobenzene	98		86-115%	SW-846 8260B	9/6/05	BAS
1,2 Dichloroethane-d4	116		80-120%	SW-846 8260B	9/6/05	BAS

WHITE COPY- Original (Accompanies Samples) YELLOW COPY-Collector PINK COPY-Project Manager

0504 - 14694
0509 - 14694

CHAIN-OF-CUSTODY RECORD

Station Number	Time (24hr.)	Container ID	Sample ID	Location Description	Sample Type	VOA 8240	VOA 8010	VOA 8020	ABN 8270	PEST/PCB	P.P. METAL	D.W. METAL	TCLP	TPH	PHC-F	GC SCREEN	BOD	COD	8260 VOC	PP list of 15 VOC	Total # of Cont.	Note #
1	11:00	SW-1		Chestnut	SW					X			X			X	X	X	X		7	1,2
2	11:30	PD-2		Chestnut	SW					X			X			X	X	X	X		7	1,2
3	13:30	Frac Tank		Chestnut	SW					X			X			X	X	X	X		7	1,2
4	12:20	LAG-5		Chestnut	SW													X			3	1,2
5		TRIP	Blank															Y			2	

TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	9-2-05 14:15	[signature]
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)

NOTES:

① all samples are 24 hour rush except BOD

② Email Results to sandrus@gza.com esummerly@gza.com

* Dissolved Metals field filtered per Steve Andrus 9/6 9:28AM

ANALYTICAL LABORATORY: RI Analytical

LABORATORY CONTACT: Leslie

GZA CONTACT: Ed Summerly, Steve Andrus TELEPHONE:

GZA GEOENVIRONMENTAL, INC.
140 Broadway
PROVIDENCE, RHODE ISLAND 02903
401-421-4140

GZA FILE NO. 32795.02 P.O. NO. 34824

PROJECT Chestnut Former Injection Response

LOCATION Richmond, RI

COLLECTOR Steve Andrus

DATE OF COLLECTION 9-2-05 SHEET 1 OF 1