

May 5, 2008  
File No. 32795.29



Ms. Joan Taylor  
Senior Environmental Scientist  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908

Re: First Quarterly Interim Compliance Monitoring Report  
Charbert, Division of N.F.A.  
Richmond, Rhode Island  
*RIDEM Case # 99-037*

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Dear Ms. Taylor:

This letter with attachments serves as the first quarterly Interim Compliance Monitoring Report, in compliance with the December 18, 2007 Order of Approval and the October 15, 2007 *Remedial Action Work Plan (RAWP)* that was prepared to address the applicable requirements of Section 9.00 of the RIDEM's Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases, (DEM-DSR01-93 Remediation Regulations) for the Charbert facility located at 299 Church Street in Richmond (Alton), Rhode Island. It was prepared by GZA GeoEnvironmental, Inc., on behalf of our client Charbert, a Division of N.F.A.

## DATA SUMMARY

This report includes the following information:

- The results of the initial baseline ICMP groundwater sampling which consisted of 14 monitoring wells within areas of active treatment and along the downgradient compliance boundaries. Nine existing wells and five newly installed groundwater monitoring wells were sampled. Groundwater sampling was conducted on January 2, 4 and 8, 2008, prior to the Soil Vapor Extraction and the shallow groundwater Air Sparging system (SVE/AS) start-up. Groundwater was analyzed for volatile organic compounds (VOCs) via EPA Method 8260B in all 14 monitoring wells and for total petroleum hydrocarbons (TPH) via EPA 8100M in 11 shallow monitoring wells. The detected analytes have been summarized and compared to RIDEM's Method 1 GA Groundwater Objectives and Groundwater Quality Preventive Action Limits (PALs) as defined in the RIDEM's *Remediation Regulations*, in the attached Table 1. The laboratory certificates of analysis are provided in Attachment A.
- The second round of groundwater sampling was conducted April 1, 2008 and consisted of 12 monitoring wells within areas of active treatment and along the downgradient compliance boundaries. Groundwater was analyzed for volatile



organic compounds (VOCs) via EPA Method 8260B. The detected analytes have been summarized and compared to RIDEM's Method 1 GA Groundwater Objectives and Groundwater Quality Preventive Action Limits (PALs) as defined in the RIDEM's *Remediation Regulations*, in the attached Table 1. The laboratory certificates of analysis are provided in Attachment A.

- Groundwater sampling was performed in general accordance with EPA's July 30, 1996 *Low Stress (low flow) Purging and Sampling Procedure* (Low Flow SOP). Low flow sampling equipment (exclusive of tubing which is dedicated) was decontaminated prior to use on-site and between each location following EPA's required protocols. Water quality monitoring for stabilization was conducted utilizing a Horiba multi-meter in a flow through cell. Field equipment used to perform the testing was calibrated according to the manufacturer's instructions before each sampling day, and confirmatory readings were taken at the end of each sampling day. The low flow field screening results for the January and the April sampling events are provided in Table 2, attached.
- The five newly installed monitoring wells (GZ-19 through GZ-23) were located along the downgradient boundaries. The new monitoring wells were constructed with 2" diameter, 0.010" slotted PVC well screens, solid PVC risers and steel stand pipes with locking caps. The wells designated GZ-19, GZ-20 and GZ-22 were installed to between 37 and 38 feet in depth, with 5 feet of screen. Monitoring wells GZ-21 and GZ-23 are "water table" wells and were installed 20 and 15 feet in depth, respectively, with 10 feet of screen installed. The soil generally consisted of a fine to coarse sand and gravel. Boring logs for the five newly installed monitoring wells are attached in Attachment B.
- The air sparge and soil vapor extraction monthly monitoring reports and associated data tables for February and March of 2008 are included as Attachment C. January 2008 was considered the startup month and a separate startup memo was prepared and submitted previously. This memo has been included here in attachment C for your convenience. The monthly reports include the following information:

#### Soil Vapor Extraction System

During each visit, the following data was measured and recorded at each of the vent wells:

1. Air flow rates;
2. Vacuum response in inches of water column (IW);
3. TVOC measurements using a PID equipped with a 10.6 eV lamp, and
4. O<sub>2</sub>, CO<sub>2</sub> and Lower Explosive Limit (LEL) measurements will be collected utilizing a Land-Tech infrared gas meter.

### Air Sparge System

During each visit, the following data was measured and recorded at each of the sparge points:

1. Air flow rates and,
2. Air pressures.



## **EVALUATION**

### Baseline Monitoring Results

The January 2008 groundwater results have been compared to the applicable groundwater standards for Rhode Island and there are contaminants that exceed the RIDEM Preventative Action Limits (PALs) and RIDEM GA Groundwater Standards for VOCs in 10 of the 14 monitoring wells. The four contaminants that exceeded the GA Groundwater Standard were vinyl chloride, cis-1,2-dichloroethene, trichloroethene (TCE) and tetrachloroethene (PCE). The remaining four monitoring wells had no detectable levels of VOCs.

The RIDEM GA Groundwater Objective for vinyl chloride is 2 µg/L, the samples from RIZ-7, GP-28 and GP-26 had levels of 15, 1,200 and 530 µg/L respectively. The GA Objective for cis-1,2-dichloroethene is 70 µg/L and the samples from GP-28 and GP-26 had levels of 1,400 and 6,800 µg/L. Trichloroethene has a GA objective of 5 and monitoring results from well locations GP-19, GZ-20, GP-26, GZ-3 and RIZ-13 were all in excess of the regulatory limit with concentrations ranging from 5.6 to 1,200 µg/L. Tetrachloroethene has a GA groundwater objective of 5 µg/L and eight monitoring well locations were in excess of the regulatory limit with concentrations ranging from 5.3 to 16,000 µg/L. Detectable total petroleum hydrocarbon (TPH) values were observed in groundwater samples from three locations (RIZ-7, GP-28 and GP-26) and ranged from 300 µg/L in RIZ-7 to 800 µg/L in GP-26.

The detected levels of each of these compounds are within historical ranges of previous analytical data collected from the Site. The distribution of contaminants in the new and existing wells is also consistent with groundwater conditions reported in the June 2005 SIR.

### First Quarter Monitoring Results

The April 2008 groundwater results have been compared to the applicable groundwater standards for Rhode Island and there are contaminants that exceed the RIDEM Preventative Action Limits (PALs) and RIDEM GA Groundwater Standards for VOCs in 9 of the 12 monitoring wells. The four contaminants that exceeded the GA Groundwater Standard were vinyl chloride, cis-1,2-dichloroethene, trichloroethene (TCE) and tetrachloroethene

(PCE). Two of the three remaining monitoring wells had no detectable levels of VOCs. One well had detectable concentrations, but not above the GA objectives or PALs.



The RIDEM GA Groundwater Objective for vinyl chloride is 2  $\mu\text{g/L}$ , the samples from GZ-21, RIZ-7, GP-28 and GP-26 had levels of 8.4, 120, 180 and 100  $\mu\text{g/L}$ , respectively. The GA Objective for cis-1,2-dichloroethene is 70  $\mu\text{g/L}$  and the samples from GP-28 and GP-26 had a level of 200 and 2,100  $\mu\text{g/L}$ . Trichloroethene has a GA objective of 5  $\mu\text{g/L}$  and monitoring well locations GZ-19, GZ-20, GP-26, GZ-7 and GZ-3 were all in excess of the regulatory limit with concentrations ranging from 17 to 2,500  $\mu\text{g/L}$ . Tetrachloroethene has a GA groundwater objective of 5  $\mu\text{g/L}$  and six monitoring well locations were in excess of the regulatory limit with concentrations ranging from 12 to 20,000  $\mu\text{g/L}$ .

The detected levels of each of these compounds are within historical ranges of previous analytical data collected from the Site. A comparison of baseline results with the first quarter results shows that there have been changes in the distribution of contaminants concentrations within the identified zone of contamination. There are also changes in the ratio of parent/daughter products (i.e., PCE relative to TCE, 1,2-DCE and VC). The observed changes are not unexpected given the level of disturbance to the aquifer introduced by the sparging and venting systems. The decrease in chlorinated daughter products is also consistent with a decrease in the level of reductive dechlorination caused by the oxygen introduced by the sparging and venting systems.

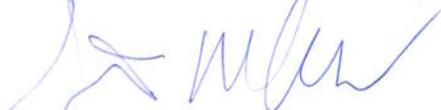
The quarterly monitoring program will be continued for 7 quarters (December 2009). At that time, an evaluation will be made to reduce the sampling frequency to semi-annual corresponding to periods of seasonal high and low groundwater (e.g., March and September). Seasonal groundwater levels will be evaluated prior to choosing a time (date) in which these samples will be collected.

We trust that this information fulfills your present needs. If you have any questions please call Stephen Andrus or Edward Summerly at (401)-421-4140.

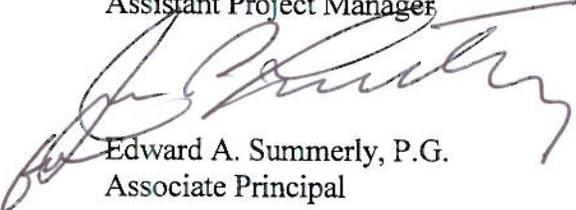
Very truly yours,



GZA GEOENVIRONMENTAL, INC.

  
Stephen Andrus, E.I.T.  
Assistant Project Manager

  
Albert Flori  
Project Reviewer

  
Edward A. Summerly, P.G.  
Associate Principal

SMA/EAS:mac

CC: Mary Morgan, Richmond Town Clerk  
Clark Memorial Library – Charbert Repository

Attachments: Tables - Table 1 - Detected Constituents  
Table 2 - Low Flow Field Screening Readings  
Attachment A – Monitoring Well Boring Logs  
Attachment B – Laboratory Certificates of Analysis  
Attachment C – Monthly AS/SVE System  
Attachment D – First Quarter 2008 UIC Report

## **TABLES**

TABLE 1  
DETECTED CONSTITUENTS SUMMARY

Charbert Facility  
Richmond, Rhode Island

GZ-21			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Vinyl Chloride	75-01-4	2	1	ug/L	<	1.0	8.4	1.0
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	7.8	1.0	10.0	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	3.5	1.0	1.7	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	7.2	1.0	2.4	1.0
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	<	200	NT	

GZ-22			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Tetrachloroethene	127-18-4	5	2.5	ug/L	14	1.0	12	1.0

GZ-23			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Trichloroethene	79-01-6	5	2.5	ug/L	<	1.0	1.8	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	<	1.0	2.4	1.0
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	<	200	NT	

GZ-19			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	4.6	1.0	<	1.0
	1,1,1-Trichloroethane	71-55-6	200	100	ug/L	13	1.0	<	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	260	250	390	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	16000	250	20000	1.0

RIZ-7			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Vinyl Chloride	75-01-4	2	1	ug/L	15	1.0	120	1.0
	trans-1,2-Dichloroethene	156-60-5	100	50	ug/L	<	1.0	2.6	1.0
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	2.5	1.0	64.0	1.0
	o-Xylene	95-47-6	NS	NS	ug/L	1.7	1.0	2.6	1.0
	2-Chlorotoluene	95-49-8	NS	NS	ug/L	1.0	1.0	1.2	1.0
	Ethylbenzene	100-41-4	700	350	ug/L	<	1.0	2.7	1.0
	m&p-Xylene	179601-231	NS	NS	ug/L	<	2.0	2.9	2.0
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	300	200	NT	

GP-28			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Vinyl Chloride	75-01-4	2	1	ug/L	1200	25	180	
	trans-1,2-Dichloroethene	156-60-5	100	50	ug/L	11	5.0	<	1.0
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	1400	25	200	
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	350	200	NT	

RIZ-5			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	2.9	1.0	<	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	2.4	1.0	<	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	5.3	1.0	<	1.0
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	<	200	NT	

TABLE 1  
DETECTED CONSTITUENTS SUMMARY

Charbert Facility  
Richmond, Rhode Island

GZ-20			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Vinyl Chloride	75-01-4	2	1	ug/L	<b>1.2</b>	1.0	<b>1.3</b>	1.0
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	<b>52</b>	1.0	<b>64</b>	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	<b>52</b>	1.0	<b>60</b>	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	<b>89</b>	1.0	<b>130</b>	1.0

RIZ-1			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS					ND		NT	
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	<	200	NT	

GP-26			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Vinyl Chloride	75-01-4	2	1	ug/L	<b>530</b>	25	<b>100</b>	1.0
	1,1-Dichloroethene	75-35-4	7	35	ug/L	<	25	<b>1.1</b>	1.0
	trans-1,2-Dichloroethene	156-60-5	100	50	ug/L	<b>70</b>	25	<b>20</b>	1.0
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	<b>6800</b>	130	<b>2100</b>	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	<b>1200</b>	25	<b>2500</b>	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	<b>1800</b>	25	<b>4100</b>	1.0
	o-Xylene	95-47-6	NS	NS	ug/L	<	25	<b>1.3</b>	1.0
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	<b>800</b>	200	NT	

GZ-7			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	<	1.0	<b>13</b>	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	<	1.0	<b>74</b>	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	<	1.0	<b>26</b>	1.0

GZ-3			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	<b>9.3</b>	1.0	<b>16</b>	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	<b>10</b>	1.0	<b>17</b>	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	<b>12</b>	1.0	<b>22</b>	1.0

RIZ-6			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS					ND		NT	
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	<	200	NT	

RIZ-13			RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	Units	Date			
						01/02/2008		04/01/2008	
						Result	Limit	Result	Limit
EPA 8260	VOLATILE ORGANICS								
	Vinyl Chloride	75-01-4	2	1	ug/L	<b>4.4</b>	1.0	<	1.0
	cis-1,2-Dichloroethene	156-59-2	70	35	ug/L	<b>6.6</b>	1.0	<	1.0
	Trichloroethene	79-01-6	5	2.5	ug/L	<b>5.6</b>	1.0	<	1.0
	Tetrachloroethene	127-18-4	5	2.5	ug/L	<b>6.9</b>	1.0	<	1.0
Mod. EPA 8100	TOTAL PETROLEUM HYDROCARBON	PHC							
	Hydrocarbon Content	PHC	NS	NS	ug/L	<	200	NT	

PAL = RIDEMs Preventative Action Limit  
**DETECTED ANALYTES ARE IN BOLD AND HIGHLIGHTED IN YELLOW**  
**RIDEM GA EXCEEDANCES ARE IN BOLD AND HIGHLIGHTED GREEN**  
**PALs EXCEEDANCES ARE IN BOLD AND HIGHLIGHTED BLUE**  
 ND = NO DETECTS  
 NS = NO STANDARD  
 NT = NOT TESTED

**TABLE 2**  
**Low Flow Field Screening Results**  
*Charbert Facility*  
*Richmond, RI*

JANUARY, 2008 GROUNDWATER SAMPLING FIELD DATA								
WELL ID	pH <sup>(3)</sup>	CONDUCTIVITY	TURBIDITY	DISSOLVED OXYGEN	TEMPERATURE	ORP	DEPTH TO GWT	GW ELEV.
	SU	mS/cm	NTU	mg/l	°C	mV	FT	FT
GP-26	4	3.000	5	0	13.9	31	8.7	40.6
GP-28	4	0.900	5	0	12.0	-47	6.8	39.9
GZ-19	4	0.338	68	0	16.5	24	9.9	40.2
GZ-20	4	0.346	280	0	15.3	8	8.7	40.3
GZ-21	4	0.337	5	1	16.4	191	12.9	39.7
GZ-22	4	0.330	5	1	15.8	198	13.1	39.6
GZ-23	4	0.339	157	0	16.6	-8	9.9	39.7
GZ-3	4	0.339	5	0	15.4	-15	8.7	40.5
GZ-7	4	0.223	5	0	14.5	-8	9.0	40.8
RIZ-1	4	0.912	5	4	13.5	256	7.3	43.0
RIZ-13	5	0.392	3	1	14.8	28	6.5	40.1
RIZ-5	4	0.465	64	0	14.7	26	6.4	40.2
RIZ-6	4	0.312	5	0	14.1	-28	4.5	41.8
RIZ-7	4	0.786	5	0	16.5	-23	6.7	40.3

APRIL, 2008 GROUNDWATER SAMPLING FIELD DATA								
WELL ID	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED OXYGEN	TEMPERATURE	ORP	DEPTH TO GWT	GW ELEV.
	SU	mS/cm	NTU	mg/l	°C	mV	FT	FT
GP-26	6	3.490	1	0	12.5	61	6.4	42.9
GP-28	5	0.492	30	0	11.1	-71	5.1	41.6
GZ-19	5	0.453	1	0	15.6	79	8.0	42.1
GZ-20	5	0.220	165	0	14.6	-38	6.8	42.2
GZ-21	5	0.660	3	0	14.4	-58	11.0	41.6
GZ-22	5	0.218	5	0	15.1	91	11.3	41.4
GZ-23	5	0.428	0	0	16.1	-60	8.2	41.4
GZ-3	5	0.392	5	0	15.4	8	6.7	42.6
GZ-7	5	0.359	5	0	14.3	-55	7.0	42.8
RIZ-1	NT	NT	NT	NT	NT	NT	NT	NT
RIZ-13	6	0.900	5	10	14.8	56	4.4	42.3
RIZ-5	5	0.919	110	7	13.5	135	4.7	42.0
RIZ-6	NT	NT	NT	NT	NT	NT	NT	NT
RIZ-7	5	0.748	0	0.0	14.4	-53	5.1	41.9

Notes:

1. Field screening parameters were collected using a Horiba Model U-22 Water Quality Monitor.
2. NT = Location Not Tested on this date.
3. The Horiba water quality meter used for the January sampling event was found to have a faulty pH sensor.

Table 2  
 Low Flow Field Screening Results  
 Project No: 03.0032795.31 Project Name: Charbert Alton, RI

JULY, 2008 GROUNDWATER SAMPLING FIELD DATA								
WELL ID	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED OXYGEN	TEMPERATURE	ORP	DEPTH TO GWT	GW ELEV.
	SU	mS/cm	NTU	mg/l	°C	mV	FT	FT
GP-26	3.55	3	5.0	0.00	13.9	31	8.7	40.6
GP-28	3.67	0.9	5.0	0.00	12.0	-47	6.8	39.9
GZ-19	3.73	0.338	68.0	0.00	16.5	24	9.9	40.2
GZ-20	3.66	0.346	280.0	0.00	15.3	8	8.7	40.3
GZ-21	3.67	0.337	5.0	0.81	16.4	191	12.9	39.7
GZ-22	3.93	0.33	5.0	0.88	15.8	198	13.1	39.6
GZ-23	3.74	0.339	157.0	0.00	16.6	-8	9.9	39.7
GZ-3	3.68	0.339	5.0	0.00	15.4	-15	8.7	40.5
GZ-7	3.56	0.223	5.0	0.00	14.5	-8	9.0	40.8
RIZ-1	3.86	0.912	5.0	4.44	13.5	256	7.3	43.0
RIZ-13	5.22	0.392	2.5	1.27	14.8	28	6.5	40.1
RIZ-5	3.8	0.465	64.0	0.00	14.7	26	6.4	40.2
RIZ-6	3.77	0.312	5.0	0.00	14.1	-28	4.5	41.8
RIZ-7	3.71	0.786	5.0	0.00	16.5	-23	6.7	40.3

Notes:

1. Field screening parameters were collected using a Horiba Model U-22 Water Quality Monitor.

**ATTACHMENT A**

**MONITORING WELL BORING LOGS**

BORING CO. <u>New England Geotech</u>	BORING LOCATION _____	
FOREMAN <u>Dan Regan</u>	GROUND SURFACE ELEV. <u>46.4'</u>	DATUM <u>TPVC 49.40'</u>
GZA ENGINEER <u>Erik Beloff</u>	DATE START <u>12/19/07</u>	DATE END <u>12/19/07</u>

SAMPLER: DIRECT PUSH GEOPROBE SAMPLER 5' LONG AND 1 5/16" DIAMETER WITH DISPOSABLE ACETATE LINER  CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING GEOPROBE WITH 66,000 POUND PNEUMATIC HAMMER  CASING SIZE: 3 1/4"      OTHER: _____	GROUNDWATER READINGS																				
	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th> <th>TIME</th> <th>WATER</th> <th>CASING</th> <th>STABILIZATION TIME</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	DATE	TIME	WATER	CASING	STABILIZATION TIME															
DATE	TIME	WATER	CASING	STABILIZATION TIME																	

DPTH (FT)	CASING BLOWS	SAMPLE				SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	R K
		NO	PEN/REC	DEPTH (FT)	BLOWS/6"					
5		S-1	60/34	0'-5'		(A) Orange/tan fine to medium SAND (24") (B) Tan fine to medium SAND, trace Gravel	R I S E R			
		S-2	60/44	5'-10'		Tan fine to medium SAND, trace Gravel (29") final 15" Gray fine to medium SAND, trace Gravel, slight chemical odor Water +/-8.5'				
10										
		S-3	60/60	10'-15'						
15										
					End of Sample Collection at ± 15'					
20										
25										
30										
35										

REMARKS:

- Boring collapsed at approximately 9' sample S-3 may not be representative of 10'-15'.
- 2" PVC monitoring well installed with 5 feet of #10 slot PVC screen from 38' to 33' BGS PVC stickup, filter sand from 38' to 31' BGS, bentonite seal from 31' to 29', filter sand from 29' to ground surface. Steel standpipe was cemented in place with locking cap installed.
- End of sample collection at ±15'. Casing driven from ground surface to ±38' below ground surface.

NOTES:

- STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
- WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.



BORING CO. <u>New England Geotech</u>	BORING LOCATION _____	
FOREMAN <u>Dan Regan</u>	GROUND SURFACE ELEV. <u>45.3</u>	DATUM <u>TPVC 48.33'</u>
GZA ENGINEER <u>Erik Beloff</u>	DATE START <u>12/19/07</u>	DATE END <u>12/19/07</u>

SAMPLER: DIRECT PUSH GEOPROBE SAMPLER  
 5' LONG AND 1 5/16" DIAMETER WITH DISPOSABLE ACETATE LINER

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING  
 GEOPROBE WITH 66,000 POUND PNEUMATIC HAMMER

CASING SIZE: 3 1/4" OTHER: \_\_\_\_\_

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME

DPTH (FT)	CASING BLOWS	SAMPLE				SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	R K				
		NO	PEN/REC	DEPTH (FT)	BLOWS/6"									
5		S-1	60/28	0'-5'		(A) 12" of fill (brick, ash, wood, etc.) Black fine to coarse SAND and Gravel (B) Tan fine to medium SAND, trace Silt	F I L T E R  R I S E R  S A N D	R I S E R						
		S-2	60/36	5'-10'		Orange/tan fine to coarse SAND and Gravel, trace Silt 6" Gray fine to medium SAND, trace Silt Water +/- 8.5'								
		S-3	60/44	10'-15'		Orange fine to coarse SAND, trace Gravel (36")  Gray fine to coarse SAND, trace Silt								
10														
15														
20						End of Sample Collection at ± 15'								
25														
30														
35														

REMARKS:

- 2" PVC monitoring well installed with 5 feet pf #10 slot PVC screen from 37.5' to 32.5' BGS, 2" PVC riser from 32.5' to 0', 3' PVC stickup, filter sand from 37.5' to 30.5' BGS. Bentonite seal from 30.5' to 28.5' BGS. Filter sand from 28.5' to ground surface. Steel standpipe was cemented in place with locking cap installed.
- End of sample collection at ±15'. Casing driven from ground surface to ±37.5' below ground surface.

NOTES:

- 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
- 2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.









BORING CO. <u>New England Geotech</u>	BORING LOCATION _____	
FOREMAN <u>Dan Regan</u>	GROUND SURFACE ELEV. <u>45.9'</u>	DATUM <u>TPVC 48.91'</u>
GZA ENGINEER <u>Erik Beloff</u>	DATE START <u>12/18/07</u>	DATE END <u>12/18/07</u>

SAMPLER: DIRECT PUSH GEOPROBE SAMPLER  
 5' LONG AND 1 5/16" DIAMETER WITH DISPOSABLE ACETATE LINER

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING  
 GEOPROBE WITH 66,000 POUND PNEUMATIC HAMMER

CASING SIZE: 3 1/4" OTHER: \_\_\_\_\_

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME

DPTH (FT)	CASING BLOWS	SAMPLE				SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	R K
		NO	PEN/REC	DEPTH (FT)	BLOWS/6"					
5		S-1	60/30	0'-5'		Orange, tan fine to medium SAND, trace Gravel, trace Silt	R I S E R  F I L T E R S C R E E N  S A N D			
10		S-2	60/28	5'-10'		Tan fine to coarse SAND and Gravel, trace Silt, dark gray fine Sand, trace Silt (slight chemical odor) Water +/- ±9'				
15		S-3	60/36	10'-15'		Dark gray, fine to coarse SAND and Gravel, trace Silt (slight chemical odor)				
20						End of exploration at ±15'				
25										
30										
35										

REMARKS:

- End of exploration at ±15'.
- 2" PVC monitoring well installed at 15' with 10 feet of #10 slot PVC screen from 15' to 5' BGS, PVC riser from 5' to 0', 3" PVC stickup, filter sand from 15' to 8' BGS, bentonite seal from 8' to 3' BGS. Steel standpipe was cemented in place with locking cap installed.

**ATTACHMENT B**

**LABORATORY CERTIFICATES OF ANALYSIS**

**ATTACHMENT C**  
**MONTHLY AS/SVE SYSTEM**



# Memo

To: Joan Taylor and Cynthia Gianfrancesco, RIDEM

From: Stephen Andrus and Ed Summerly

CC: Mary Morgan, Richmond Town Clerk  
Clark's Memorial Library – Charbert Repository

File No: 32795.16

Date: March 30, 2008

Re: Air Sparge and Soil Vapor Extraction System Start-up Report  
Charbert Manufacturing Facility, Alton, Rhode Island  
RIDEM Case # 99-037

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The air sparge and soil vapor extraction remedial system at the Charbert Manufacturing Facility in Alton, Rhode Island was designed and installed by GZA in December of 2007 through January of 2008. The system was issued an Order of Approval from the Rhode Island Department of Environmental Management on December 18, 2007 and began full operation on January 18, 2008.

The air sparge system (AS), is designed to inject air into the groundwater using a grid pattern of 1-inch diameter sparge wells. The purpose of the air injection is to introduce oxygen to enhance bioremediation and expedite the volatilization of the contaminants. The soil vapor extraction system (SVE), uses a blower to apply vacuum to a series of 2-inch wells installed above the groundwater table. The system collects the vapors from the natural breakdown and volatilization of the contaminants generated by the air sparge system and also helps circulate oxygen rich air through unsaturated contaminated soils stimulating bioremediation of contaminants (bioventing). The air collected by the SVE system is then filtered through activated carbon to collect the contaminants. The treated air is then discharged to the atmosphere.

The remedial system consist of an interior AS/SVE located under the concrete floor in the approximate center of the mill building and an exterior AS/SVE system that is located under the rear maintenance area parking lot on the west side of the mill building. The system controls, SVE blowers and carbon filters are located in the west end of the facility, near the boiler room. The air is supplied by a central air compressor located in the eastern side of the mill building.

The interior AS system consists of 16 air injection wells that inject air approximately 25 to 30 feet below the floor of the mill. At this depth the air is injected approximately 19 to 24 feet below the groundwater surface. The interior SVE system consists of 16 soil vapor extraction wells and 7 sub-slab vents. The SVE wells are collecting vapors from 2 to 17 feet below the mill floor. The sub-slab vent wells are located around the perimeter of the interior system and remove any vapors that may collect under the concrete floors. Table 1 lists the interior remedial system specifics:

TABLE 1: Interior Remedial System

Air Supply: Central Rotary Screw Compressor	
Blower: 5 Horse Power	
Total Air Volume Injected:	24 SCFM
Total Air Volume Removed:	157 SCFM
Average AS Well Flow, :	1.5 SCFM
Average SVE Well Flow:	6.8 SCFM
Estimated Contaminant Removal:	55 lbs/year

*SCFM = Standard Cubic Feet per Minute*

The exterior AS system consists of 14 air injection wells that inject air approximately 25 to 30 feet below the ground surface. At this depth the air is injected approximately 20 to 25 feet below the groundwater surface. To protect the Wood River a line of 5-sparge wells are located along the river bank between the river and the contaminated area. The SVE system consists of 14 soil vapor extraction trenches that are collecting vapors 2 feet below the ground surface. The soil vapor collection trenches are installed similar to septic system leachfield piping. Table 2 lists the exterior remedial system specifics:

TABLE 2: Exterior Remedial System

Air Supply: Central Rotary Screw Compressor	
Blower: 1 Horse Power	
Total Air Volume Injected	24 SCFM
Total Air Volume Removed:	82 SCFM
Average AS Well Flow:	1.7 SCFM
Average SVE Well Flow:	5.8 SCFM
Estimated Contaminant Removal:	55 lbs/year

*SCFM = Standard Cubic Feet per Minute*

The remedial systems are monitored weekly by Charbert personnel. GZA personnel conduct monthly performance monitoring for the soil vapor extraction/air sparge system. The air flow and vacuum readings are taken at each well and the exhaust air flow rates and contaminant concentrations are evaluated with field equipment. Data collected at each SVE well include: total volatile organic compounds (by volume), carbon dioxide (percent by volume), methane (percent by volume), lower explosive limit and oxygen level (percent by volume).

To monitor the effectiveness of the remedial system an Interim Compliance Monitoring Plan, as approved by RIDEM in December of 2007, is ongoing and was started with a baseline round of groundwater samples collected from 14 groundwater monitoring wells in January of 2008. On a quarterly basis groundwater samples are collected from 12 wells located around the perimeter of the contaminated area and the samples analyzed for volatile organic compounds (VOCs). Quarterly sample analysis consists of six field screening parameters (temperature, pH, oxidation/reduction potential (ORP), specific conductivity, turbidity, and dissolved oxygen) and laboratory analysis for volatile organic compounds (VOCs) via EPA Method 8260B. On a yearly basis groundwater samples are also collected from two additional background wells. Annual sample analysis includes the six field parameters, VOCs and total petroleum hydrocarbon analysis, via EPA 8100M from the 9 shallow overburden wells (15 foot deep +/-).

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**SVE MONITORING**

**JANUARY 18, 2008**

Name: Al Flor/Angela Harvey  
 Date: 1/18/08  
 Hour meter: 0

**TABLE 1**

**INTERIOR SVE SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-1	1.0	20.0	0.5	0.0	0	0.9	0.016	6.8	Interior SVE system start-up 1/18/08
SVE-2	0.4	20.0	0.6	0.0	0	2.8	0.018	7.2	
SVE-3	0.5	20.0	0.5	0.0	0	0.3	0.016	6.8	
SVE-4	2.0	19.4	0.6	0.0	0	1.3	0.017	6.8	
SVE-5	0.9	19.4	0.5	0.0	0	3.1	0.012	6.0	
SVE-6	1.2	19.7	0.7	0.0	0	2.2	0.016	6.8	
SVE-7	0.7	19.2	0.6	0.0	0	3.3	0.017	6.8	
SVE-8	0.6	18.7	1.1	0.0	0	3.3	0.016	6.8	
SVE-9	1.2	18.6	1.3	0.0	0	1.4	0.016	6.8	
SVE-10	0.7	19.0	1.1	0.0	0	1.9	0.015	6.4	
SVE-11	1.2	16.2	3.1	0.0	0	2.0	0.017	6.8	
SVE-12	0.9	17.2	2.8	0.0	0	3.9	0.014	6.4	
SVE-13	0.5	19.9	0.4	0.0	0	2.2	0.018	7.2	
SVE-14	0.6	19.7	0.6	0.0	0	2.3	0.017	6.8	
SVE-15	0.6	20.1	0.3	0.0	0	0.8	0.016	6.8	
SVE-16	0.6	20.1	0.2	0.0	0	2.0	0.017	6.8	
SSVW-1	0.1	20.0	0.3	0.0	0	1.6	0.017	6.8	
SSVW-2	0.1	20.1	0.3	0.0	0	2.8	0.012	6.0	
SSVW-3	1.2	19.6	0.4	0.0	0	1.8	0.018	7.2	
SSVW-4	0.3	18.1	1.5	0.0	0	1.4	0.017	6.8	
SSVW-5	1.1	19.7	0.3	0.0	0	0.3	0.017	6.8	
SSVW-6	1.0	19.9	0.4	0.0	0	1.7	0.017	6.8	
SSVW-7	0.3	20.2	0.0	0.0	0	0.1	0.017	6.8	
Combine (BD)	4.4	20.1	0.8	0.0	0	8.9	--	--	
Combine (DH)	--	--	--	--	--	18.0	--	--	
Combine (AD)	--	--	--	--	--	25.6	--	--	
Combine (AB)	--	--	--	--	--	16.7	--	155.0	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 155 scfm per 23 wells = 6.7 scfm per well = 0.015 inches DP per well.

Name: Al Flor/Angela Harvey  
 Date: 1/18/2008  
 Hour meter: 0

**TABLE 2**

**EXTERIOR SVE SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-17	1.4	18.2	1.8	0.0	0	2.8	0.010	5.6	
SVE-18	1.6	16.1	3.5	0.0	0	2.8	0.000	0.0	
SVE-19	1.7	11.3	7.3	0.0	0	2.8	0.004	3.4	
SVE-20	1.4	18.1	3.0	0.0	0	2.4	0.009	5.2	
SVE-21	1.1	19.8	2.2	0.0	0	2.1	0.004	3.4	
SVE-22	2.8	20.9	0.5	0.0	0	1.8	0.010	5.6	
SVE-23	1.8	17.6	2.5	0.0	0	2.0	0.004	3.4	
SVE-24	1.5	20.9	0.8	0.0	0	1.4	0.010	5.6	
SVE-25	1.4	20.0	0.5	0.0	0	2.0	0.009	5.2	
SVE-26	1.1	20.9	0.2	0.0	0	0.6	0.010	5.6	
SVE-27	1.2	20.8	0.3	0.0	0	2.0	0.007	4.6	
SVE-28	1.1	20.9	0.4	0.0	0	2.0	0.004	3.4	
SVE-29	0.7	20.9	0.4	0.0	0	2.0	0.004	3.4	
SVE-30	0.6	20.9	0.4	0.0	0	2.0	0.006	4.2	
Combine (BD)	4.9	19.4	1.5	0.0	0	5.9	--	--	
Combine (DH)	--	--	--	--	--	7.0	--	--	
Combine (AD)	--	--	--	--	--	13.6	--	--	
Combine (AB)	--	--	--	--	--	5.3	--	58.6	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 58.6 scfm per 14 wells = 4.18 scfm per well = .006 inches DP per well.

**SVE & AS MONITORING**

**JANUARY 24, 2008**

Name: AJ Florit/Angela Harvey

Date: 1/24/2008

Hour meter: 175.7

**TABLE 1**

**INTERIOR SVE SYSTEM**

Charbert Facility  
 Allon, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-1	6.0	19.9	0.2	0.0	0	2.0	0.025	8.4	
SVE-2	3.0	19.9	0.2	0.0	0	3.0	0.020	7.6	
SVE-3	3.0	19.9	0.1	0.0	0	2.1	0.021	7.6	
SVE-4	4.0	20.0	0.1	0.0	0	1.6	0.019	7.2	
SVE-5	4.0	19.9	0.1	0.0	0	4.2	0.019	7.2	
SVE-6	3.0	19.9	0.3	0.0	0	2.3	0.021	7.6	
SVE-7	2.0	20.6	0.2	0.0	0	4.5	0.014	6.4	
SVE-8	2.0	20.4	0.3	0.0	0	3.5	0.020	7.6	
SVE-9	3.0	20.4	0.3	0.0	0	1.7	0.019	7.2	
SVE-10	7.0	20.2	0.2	0.0	0	2.3	0.022	8.0	
SVE-11	8.0	19.9	0.6	0.0	0	2.3	0.021	7.6	
SVE-12	9.0	19.7	0.5	0.0	0	4.6	0.020	7.6	
SVE-13	5.0	20.1	0.1	0.0	0	2.3	0.022	8.0	
SVE-14	4.0	20.0	0.2	0.0	0	2.5	0.021	7.6	
SVE-15	6.0	20.0	0.2	0.0	0	1.0	0.023	8.0	
SVE-16	6.0	20.1	0.2	0.0	0	2.5	0.024	8.4	
SSVW-1	2.0	20.0	0.1	0.0	0	1.9	0.015	6.4	
SSVW-2	2.5	20.0	0.1	0.0	0	2.7	0.020	7.6	
SSVW-3	2.0	20.2	0.2	0.0	0	1.4	0.019	7.2	
SSVW-4	5.0	19.8	0.8	0.0	0	1.2	0.021	7.6	
SSVW-5	12.0	20.2	0.2	0.0	0	0.1	0.020	7.6	
SSVW-6	8.0	19.8	0.2	0.0	0	3.2	0.019	7.2	
SSVW-7	0.8	20.9	0.1	0.0	0	0.1	0.023	8.0	
Combine (BD)	4.8	20.5	0.2	0.0	0	9.7	--	--	
Combine (DH)	--	--	--	--	--	19.0	--	--	
Combine (AD)	--	--	--	--	--	26.4	--	--	
Combine (AB)	--	--	--	--	--	17.6	--	175	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 175 scfm per 23 wells = 7.6 scfm per well = 0.02 inches DP per well.

Name: Al Flor/Steve Andrus  
 Date: 1/24/2008  
 Hour meter:

**TABLE 2**

**EXTERIOR SVE SYSTEM**

Charbert Facility  
 Alton, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-17	3.0	19.9	0.5	0.1	2	1.6	0.012	6.0	
SVE-18	1.0	19.2	0.8	0.0	0	2.8	0.006	4.2	
SVE-19	1.0	18.3	1.5	0.0	0	2.8	0.008	5.0	
SVE-20	1.0	19.7	0.8	0.0	0	2.3	0.013	6.0	
SVE-21	<0.1	20.7	0.1	0.0	0	2.5	0.005	4.0	
SVE-22	1.0	20.9	0.1	0.0	0	1.0	0.011	6.0	
SVE-23	1.0	20.9	0.1	0.0	0	1.4	0.012	6.0	
SVE-24	2.0	20.5	0.3	0.0	0	1.0	0.013	6.4	
SVE-25	3.0	19.4	0.4	0.0	0	1.8	0.009	5.2	
SVE-26	1.0	20.9	0.1	0.0	0	0.5	0.013	6.0	
SVE-27	1.0	20.9	0.1	0.0	0	1.7	0.010	5.6	
SVE-28	1.0	20.9	0.0	0.0	0	1.7	0.006	4.2	
SVE-29	1.0	20.7	0.1	0.0	0	1.6	0.005	4.0	
SVE-30	2.0	20.6	0.2	0.0	0	1.6	0.009	5.2	
Combine (BD)	5.5	20.3	0.4	0.0	0	5.5	--	--	
Combine (DH)	--	--	--	--	--	6.0	--	--	
Combine (AD)	--	--	--	--	--	13.3	--	--	
Combine (AB)	--	--	--	--	--	5.5	--	85	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 85 scfm per 14 wells = 6 scfm per well = 0.012 inches DP per well.

**TABLE 3**

**INTERIOR AS SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	Pressure (psi)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
AS-1	6	0.28	0.6	Interior AS startup 1/24/2008
AS-2		0.70	1.2	
AS-3	7	0.44	1.0	
AS-4		0.51	1.0	
AS-5		0.52	1.0	
AS-6		0.50	1.0	
AS-7	6.5	0.57	1.1	
AS-8		0.70	1.2	
AS-9		0.11	0.3	
AS-10	6	0.54	1.0	
AS-11		0.55	1.0	
AS-12		0.10	0.3	
AS-13		0.84	1.4	
AS-14	7	0.64	1.1	
AS-15		0.64	1.1	
AS-16	6.5	0.70	1.2	
Combine	8.5	4.0-4.8	21	

Combined 4.0 inches DP @ 8.0 psi = 21 scfm per 16 wells = 1.3 scfm per well = 0.9 inches DP per well.

**TABLE 4**  
**EXTERIOR AS SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	Pressure (psi)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
AS-17	10.50	1.3	1.8	Exterior AS startup 1/24/2008
AS-18		1.1	1.6	
AS-19		1.3	1.8	
AS-20	9.00	1.2	1.6	
AS-21		1.3	1.8	
AS-22		0.8	1.4	
AS-23		0.6	1.2	
AS-24		1.4	1.8	
AS-25		1.0	1.5	
AS-26	9.00	1.4	1.8	
AS-27		1.2	1.6	
AS-28		1.3	1.8	
AS-29		1.4	1.8	
AS-30	12	0.7	1.3	
Combine		5.0	24	

Combined 5.0 inches DP @ 12 psi = 24 scfm per 14 wells = 1.7 scfm per well = 1.2 inches DP per well.

**SVE & AS MONITORING**

**FEBRUARY 26, 2008**

Name: Angela Harvey  
 Date: 2/26/2008  
 Hour meter: 967.1

**TABLE 1**  
**INTERIOR SVE SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-1	1.5	20.6	0.1	0.0	0	2.0	0.017	6.8	
SVE-2	2.0	20.6	0.0	0.0	0	2.6	0.017	6.8	
SVE-3	2.3	20.6	0.0	0.0	0	1.5	0.016	6.8	
SVE-4	3.0	20.3	0.1	0.0	0	1.3	0.016	6.8	
SVE-5	2.4	20.4	0.1	0.0	0	4.1	0.018	7.2	
SVE-6	3.1	20.5	0.0	0.0	0	2.1	0.019	7.2	
SVE-7	3.1	20.5	0.1	0.0	0	4.1	0.018	7.2	
SVE-8	3.8	20.5	0.1	0.0	0	3.2	0.017	6.8	
SVE-9	3.3	20.2	0.1	0.0	0	1.8	0.019	7.2	
SVE-10	1.2	20.7	0.1	0.0	0	2.1	0.018	7.2	
SVE-11	1.6	20.3	0.3	0.0	0	2.1	0.017	6.8	
SVE-12	1.8	20.5	0.1	0.0	0	4.0	0.016	6.8	
SVE-13	2.7	20.3	0.1	0.0	0	1.7	0.018	7.2	
SVE-14	4.5	20.3	0.0	0.0	0	1.6	0.017	6.8	
SVE-15	1.5	20.9	0.1	0.0	0	1.1	0.019	7.5	
SVE-16	1.3	20.6	0.1	0.0	0	2.2	0.016	6.8	
SSVW-1	1.8	20.4	0.1	0.0	0	1.3	0.018	7.2	
SSVW-2	1.2	20.6	0.0	0.0	0	1.4	0.016	6.8	
SSVW-3	1.8	20.5	0.2	0.0	0	1.5	0.016	6.8	
SSVW-4	5.2	20.1	0.3	0.0	0	1.5	0.017	6.8	
SSVW-5	5.3	20.3	0.2	0.0	0	0.3	0.016	6.8	
SSVW-6	1.1	20.7	0.1	0.0	0	2.7	0.018	7.2	
SSVW-7	1.2	20.8	0.0	0.0	0	0.8	0.018	7.2	
Combine (BD)	2.0	20.1	0.1	0.0	0	13.2	--	--	
Combine (DH)	--	--	--	--	--	22.0	--	--	
Combine (AD)	--	--	--	--	--	27.3	--	--	
Combine (AB)	--	--	--	--	--	16.4	--	157	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 157 scfm per 23 wells = 6.8 scfm per well = .017 inches DP per well.

Name: Angela Harvey  
 Date: 2/26/2008  
 Hour meter: 984.9

**TABLE 2**  
**EXTERIOR SVE SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-17	0.9	22.1	0.4	0.0	0	2.4	0.011	6.0	
SVE-18	1.1	22.0	0.4	0.0	0	2.3	0.008	5.0	
SVE-19	1.1	21.6	0.7	0.0	0	3.7	0.006	4.2	
SVE-20	0.9	22.3	0.3	0.0	0	3.7	0.013	6.0	
SVE-21	0.5	22.6	0.1	0.0	0	3.1	0.006	4.2	
SVE-22	0.7	22.3	0.1	0.0	0	2.2	0.011	6.0	
SVE-23	0.5	22.3	0.3	0.0	0	2.7	0.012	6.0	
SVE-24	0.5	21.9	0.1	0.0	0	1.3	0.012	6.0	
SVE-25	0.7	22.5	0.1	0.0	0	2.6	0.012	6.0	
SVE-26	0.7	20.9	0.1	0.0	0	0.7	0.011	6.0	
SVE-27	0.3	21.5	0.1	0.0	0	2.3	0.014	6.4	
SVE-28	0.3	21.3	0.1	0.0	0	3.2	0.000	0.0	
SVE-29	0.4	21.3	0.0	0.0	0	3.1	0.005	4.0	
SVE-30	0.4	21.1	0.1	0.0	0	2.1	0.011	6.0	
Combine (BD)	1.9	20.3	0.2	0.0	0	7.1	--	--	
Combine (DH)	--	--	--	--	--	10.0	--	--	
Combine (AD)	--	--	--	--	--	14.4	--	--	
Combine (AB)	--	--	--	--	--	5.2	--	82	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 82 scfm per 14 wells = 5.8 scfm per well = 0.011 inches DP per well.

**TABLE 3**

**INTERIOR AS SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	Pressure (psi)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
AS-1		1.00	1.4	
AS-2	7.00	0.95	1.4	
AS-3		0.93	1.4	
AS-4		0.92	1.4	
AS-5	8.00	1.07	1.5	
AS-6		0.92	1.4	
AS-7		0.92	1.4	
AS-8	8.00	1.06	1.5	
AS-9		0.97	1.0	
AS-10		1.03	1.4	
AS-11	7.00	0.87	1.3	
AS-12		0.95	1.4	
AS-13		0.51	1.1	
AS-14	8.00	0.93	1.4	
AS-15	8	0.92	1.4	
AS-16	8	0.97	1.0	
Combine	10	4.87	24	

Combined 5.0 inches DP @ 10 psi = 24 scfm per 16 wells = 1.5 scfm per well = 1.0 inches DP per well.

**TABLE 4**

**EXTERIOR AS SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	Pressure (psi)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
AS-17		1.26	1.8	
AS-18		1.21	1.7	
AS-19	11.00	1.31	1.8	
AS-20		1.35	1.8	
AS-21		1.26	1.7	
AS-22		1.38	1.8	
AS-23	10.00	1.26	1.7	
AS-24		1.38	1.8	
AS-25		1.39	1.8	
AS-26		0.57	1.2	
AS-27		1.30	1.8	
AS-28	10.00	1.32	1.8	
AS-29		1.22	1.7	
AS-30		0.94	1.5	
Combine	13	4.74	24.0	

Combined 4.9 inches DP @ 13 psi = 24 scfm per 14 wells = 1.71 scfm per well = 1.30 inches DP per well.

**SVE & AS MONITORING**

**MARCH 26, 2008**

Name: Angela Harvey  
 Date: 3/26/2008  
 Hour meter: 1639.5

**TABLE 1**  
**INTERIOR SVE SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-1	0.2	20.0	0.1	0.0	0	0.6	0.020	7.6	
SVE-2	<0.1	20.1	0.1	0.0	0	1.4	0.017	7.2	
SVE-3	0.2	20.0	0.1	0.0	0	1.4	0.018	7.2	
SVE-4	0.2	20.0	0.2	0.0	0	1.1	0.018	7.2	
SVE-5	<0.1	20.1	0.1	0.0	0	3.5	0.020	7.6	
SVE-6	0.2	20.0	0.1	0.0	0	1.9	0.020	7.6	
SVE-7	0.2	19.7	0.3	0.0	0	2.6	0.016	6.8	
SVE-8	<0.1	19.8	0.3	0.0	0	2.6	0.019	7.6	
SVE-9	--	--	--	--	--	--	--	--	Condensation in line.
SVE-10	0.2	19.8	0.3	0.0	0	1.8	0.015	6.8	
SVE-11	1.3	19.6	0.5	0.0	0	2.8	0.014	6.4	
SVE-12	--	--	--	--	--	--	--	--	Condensation in line.
SVE-13	0.2	20.1	0.1	0.0	0	2.1	0.019	7.6	
SVE-14	0.2	20.2	0.1	0.0	0	2.0	0.017	7.2	
SVE-15	1.9	19.9	0.1	0.0	0	0.9	0.017	7.2	
SVE-16	0.6	19.8	0.1	0.0	0	1.8	0.014	6.4	
SSVW-1	<0.1	20.1	0.1	0.0	0	1.1	0.020	7.6	
SSVW-2	<0.1	20.2	0.1	0.0	0	1.6	0.018	7.2	
SSVW-3	0.2	20.0	0.1	0.0	0	0.4	0.015	6.8	
SSVW-4	0.2	20.1	0.3	0.0	0	1.1	0.017	7.2	
SSVW-5	0.2	20.2	0.1	0.0	0	0.2	0.015	6.8	
SSVW-6	2.4	19.9	0.2	0.0	0	1.5	0.015	6.8	
SSVW-7	1.9	20.0	0.1	0.0	0	0.1	0.018	7.2	
Combine (BD)						29.1	--	--	
Combine (DH)	--	--	--	--	--	36.0	--	--	
Combine (AD)	--	--	--	--	--	41.4	--	--	
Combine (AB)	--	--	--	--	--	14.2	--	14.0	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 140 scfm per 23 wells = 6.08 scfm per well = 0.014 inches DP per well.

Name: Angela Harvey  
 Date: 3/26/2008  
 Hour meter: 1657.4

**TABLE 2**  
**EXTERIOR SVE SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	TVOC (ppm)	O2 (%)	CO2 (%)	CH4 (%)	LEL (%)	Vacuum (in.)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
SVE-17	1.5	20.4	0.2	0.0	0	2.0	0.013	6.0	
SVE-18	3.3	20.3	0.1	0.0	0	3.7	0.010	5.6	
SVE-19	3.3	20.0	0.3	0.0	0	3.6	0.005	4.0	
SVE-20	2.8	19.8	0.3	0.0	0	2.9	0.013	6.0	
SVE-21	0.2	19.5	0.1	0.0	0	3.2	0.008	5.0	
SVE-22	1.1	19.4	0.1	0.0	0	1.3	0.011	5.6	
SVE-23	1.9	19.5	0.1	0.0	0	1.6	0.010	5.6	
SVE-24	2.8	19.6	0.1	0.0	0	1.0	0.012	6.0	
SVE-25	0.6	19.4	0.0	0.0	0	2.5	0.013	6.0	
SVE-26	1.1	19.7	0.1	0.0	0	0.6	0.011	5.6	
SVE-27	0.2	19.7	0.1	0.0	0	2.4	0.012	6.0	
SVE-28	0.2	19.7	0.0	0.0	0	3.2	0.000	0.0	
SVE-29	0.2	19.7	0.0	0.0	0	3.0	0.000	0.0	
SVE-30	0.2	19.6	0.1	0.0	0	3.0	0.000	0.0	
Combine (BD)						6.7		--	
Combine (DH)	--	--	--	--	--	8.0	--	--	
Combine (AD)	--	--	--	--	--	18.9	--	--	
Combine (AB)	--	--	--	--	--	4.6	--	80	
Effluent 1st drum	<0.1	--	--	--	--	--	--	--	
Effluent 2nd drum	<0.1	--	--	--	--	--	--	--	

Combined 80 scfm per 14 wells = 5.71 scfm per well = 0.011 inches DP per well.

Name: Angela Harvey  
 Date: 3/26/2008

**TABLE 3**

**INTERIOR AS SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	Pressure (psi)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
AS-1		1.18	1.6	
AS-2	8	1.14	1.6	
AS-3		1.12	1.6	
AS-4		1.08	1.6	
AS-5	10	1.16	1.7	
AS-6		1.24	1.7	
AS-7		1.10	1.6	
AS-8	9	1.28	1.7	
AS-9		1.19	1.7	
AS-10		1.24	1.6	
AS-11	8	1.18	1.6	
AS-12		1.21	1.6	
AS-13	9	1.05	1.6	
AS-14		0.90	1.4	
AS-15	8	1.13	1.6	
AS-16	8	1.18	1.6	
Combine	11	6.4	26.5	

Combined 6.4 inches DP @ 11 psi = 26.5 scfm per 16 wells = 1.65 scfm per well = 1.2 inches DP per well.

**TABLE 4**  
**EXTERIOR AS SYSTEM**  
 Charbert Facility  
 Alton, Rhode Island

Location	Pressure (psi)	Diff Pressure (in of water)	Flow (ft <sup>3</sup> /min)	Notes:
AS-17	12	0.90	1.5	
AS-18		0.93	1.5	
AS-19		1.03	1.6	
AS-20	10	1.10	1.7	
AS-21		0.98	1.5	
AS-22		0.91	1.5	
AS-23		1.03	1.6	
AS-24		1.08	1.6	
AS-25		1.05	1.6	
AS-26	10	0.29	0.8	
AS-27		1.03	1.6	
AS-28		1.07	1.6	
AS-29		0.95	1.5	
AS-30		0.98	1.5	
Combine	11	3.90	21	

Combined 3.9 inches DP @ 13 psi = 21.25 scfm per 14 wells = 1.517 scfm per well = 0.9 inches DP per well.

**ATTACHMENT D**

FIRST QUARTER 2008 UIC REPORT

March 31, 2008  
File No. 32795.33



Mr. Craig Roy  
Senior Environmental Scientist  
RI Department of Environmental Management  
Office of Water Resources  
235 Promenade Street  
Providence, Rhode Island 02908

Re: First Quarter 2008 UIC Monitoring Report  
Charbert, Division of N.F.A.  
Richmond, Rhode Island  
(UIC Order of Approval # 1108)

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
FAX 401-751-8613  
www.gza.net

Dear Mr. Roy:

This letter with attachments serves as the First Quarterly UIC Monitoring Report of 2008, in compliance with the above referenced UIC Order of Approval for the Charbert facility located at 299 Church Street in Richmond (Alton), Rhode Island. It was prepared by GZA GeoEnvironmental, Inc., on behalf of our client Charbert, a Division of N.F.A. This report includes the following information:

- Analytical test results from the Pump House effluent and monitoring wells. Pump House effluent was analyzed for total metals (RCRA 8), dissolved chromium, volatile organic compounds (VOCs), the semi-volatile organic compound bis(2-Ethylhexyl) phthalate, and total petroleum hydrocarbons (TPH). Six monitoring wells (designated MW-1A, MW-2A, MW-3, MW-4A, MW-5B, and MW-6) were also analyzed for the above referenced parameters with the exception of metals, which were limited to total and dissolved chromium. The detected analytes have been summarized and compared to RIDEM's GA Groundwater Objectives and Groundwater Quality Preventative Action Limits (PALs) in Table 1, attached.
- The daily process water flow rate to the lagoons is summarized in Table 2.
- Disposal system usage and monitoring well maintenance activities are summarized in Table 3.
- Static groundwater elevation measurements and field screening logs of the monitoring wells are provided in Attachment A.
- Laboratory Certificates of Analysis are provided in Attachment B.

As we discussed on February 12, 2008, the Charbert Facility is in the process of closing. This sampling was performed on February 21, 2008, the last scheduled day of full production. The facility is currently finishing the final orders and preparing to close.

The groundwater results have been compared to the applicable groundwater standards for Rhode Island and there are no VOC, SVOC or TPH exceedances. However, as noted on Table 1, total chromium in samples from wells MW-1A and MW-2A was above the PAL, but still below the GA groundwater objective of 100 µg/l.



The Pump House composite sample was also compared to the GA Groundwater Objectives for Rhode Island as a point of reference. The RIDEM GA Groundwater Objective for chromium is 100 µg/l, while the Pump House composite sample had a total chromium level of 370 µg/l. The observed total petroleum hydrocarbon (TPH) value from the Pump House composite sample is 23 mg/l and was composed of greater than 90% non-petroleum based organosiloxane compounds. Acetone was detected at a concentration of 450 µg/l in the sample from the pump house. RIDEM has not established a groundwater standard for acetone, so for reference purposes, we compared the findings to the EPA Region 9's preliminary remediation goals (PRGs). The PRG for acetone in drinking water is 610 µg/l, above the observed levels. The detected levels of each of these compounds are within historical ranges.

We trust that this information fulfills your present needs. If you have any questions please call Stephen Andrus or Edward Summerly at (401)-421-4140.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read 'Stephen Andrus', written over a light blue horizontal line.

Stephen Andrus, E.I.T.  
Assistant Project Manager

A handwritten signature in blue ink, appearing to read 'Edward A. Summerly', written over a light blue horizontal line.

Edward A. Summerly, P.G.  
Associate Principal

SA/EAS:mac

CC: Mary Morgan, Richmond Town Clerk  
Clark Memorial Library – Charbert Repository

Attachments: Tables - Table 1 Detected Constituents  
Table 2 Daily Flow Rates  
Table 3 Lagoon Use and Maintenance Schedule  
Attachment A - Low Flow Sampling Logs  
Attachment B - Laboratory Certificates of Analysis

## TABLES

TABLE 1  
 UIC MONITORING DETECTED CONSTITUENTS  
 FEBRUARY 2008

Charbert Facility  
 Richmond, Rhode Island

	RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	UNITS	MW-1A (GP-29) 02/21/2008		MW-2A 02/21/2008		MW-3 (RIZ-15) 02/21/2008		MW-4A 02/21/2008	
				Result	Limit	Result	Limit	Result	Limit	Result	Limit
<b>VOLATILE ORGANICS:</b>											
Acetone	NS	NS	ug/L (ppb)	<	25	27	25	<	25	<	25
Toluene	1,000	500	ug/L (ppb)	<	1	<	1	<	1	<	1
Naphthalene	100	50	ug/L (ppb)	<	2	<	2	<	2	<	2
4-Methyl-2-Pentanone	NS	NS	ug/L (ppb)	<	<	<	<	<	<	<	<
1,2,4-Trimethylbenzene	NS	NS	ug/L (ppb)	<	<	<	<	<	<	<	<
<b>SEMI-VOLATILE ORGANICS:</b>											
bis(2-Ethylhexyl)Phthalate	NS	NS	ug/L (ppb)	<	10	<	10	<	10	<	20
<b>TOTAL PETROLEUM HYDROCARBONS:</b>											
Hydrocarbon Content	NS	NS	mg/L (ppm)	2.2	0.2	4.8	0.2	0.27	0.2	1.9	0.2
<b>TOTAL METALS:</b>											
Chromium	100	50	ug/L (ppb)	74	50	95	50	<	5	33	5
Barium	2000	500	ug/L (ppb)								
<b>DISSOLVED METALS:</b>											
Chromium	NS	NS	ug/L (ppb)	54	5	71	5	<	5	28	5

PAL = RIDEMs Preventative Action Limit  
 DETECTED ANALYTES ARE IN BOLD AND HIGHLIGHTED

< = NOT DETECTED

NT = NOT TESTED

NS = NO STANDARD

NOTE: The Total Petroleum Hydrocarbon content of the Pump House sample consist of greater than 90% non-petroleum based organosiloxanes

INDICATES DETECTED CONSTITUANT  
 INDICATES RIDEM GA EXCEEDANCE  
 INDICATES RIDEM PAL EXCEEDANCE

Groundwater quality criteria applied only to groundwater samples.

TABLE 1  
 UIC MONITORING DETECTED CONSTITUENTS  
 FEBRUARY 2008

Charbert Facility  
 Richmond, Rhode Island

	RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	UNITS	MW-5B (GP-30) 02/21/2008		MW-6 (RIZ-20) 02/21/2008		PUMP HOUSE 02/22/2008	
				Result	Limit	Result	Limit	Result	Limit
<b>VOLATILE ORGANICS:</b>									
Acetone	NS	NS	ug/L (ppb)	<	25	<	25	450	25
Toluene	1,000	500	ug/L (ppb)	<	1	<	1	<	1
Naphthalene	100	50	ug/L (ppb)	<	2	<	2	3	2
4-Methyl-2-Pentanone	NS	NS	ug/L (ppb)	<	<	<	<	37	25
1,2,4-Trimethylbenzene	NS	NS	ug/L (ppb)	<	<	<	<	1.2	1
<b>SEMI-VOLATILE ORGANICS:</b>									
bis(2-Ethylhexyl)Phthalate	NS	NS	ug/L (ppb)	<	10	<	10	<	10
<b>TOTAL PETROLEUM HYDROCARBONS:</b>									
Hydrocarbon Content	NS	NS	mg/L (ppm)	0.6	0.2	<	0.2	23	0.2
<b>TOTAL METALS:</b>									
Chromium	100	50	ug/L (ppb)	6.6	5	<	5	370	5
Barium	2000	500	ug/L (ppb)					34	5
<b>DISSOLVED METALS:</b>									
Chromium	NS	NS	ug/L (ppb)	6.4	5	<	5	340	5

PAL = RIDEMs Preventative Action Limit  
 DETECTED ANALYTES ARE IN BOLD AND HIGHLIGHTED

< = NOT DETECTED

NT = NOT TESTED

NS = NO STANDARD

NOTE: The Total Petroleum Hydrocarbon content of the Pump House sample consist of greater than 90% non-petroleum based organosiloxanes

INDICATES DETECTED CONSTITUANT

INDICATES RIDEM GA EXCEEDANCE

INDICATES RIDEM PAL EXCEEDANCE

Groundwater quality criteria applied only to groundwater samples.

**TABLE 2  
UIC MONITORING  
DAILY PROCESS WASTE WATER FLOW VOLUMES  
FEBRUARY 2008**

Charbert Facility  
Richmond, Rhode Island

DATE	MAG METER READING (Gallons)	MAG METER FLOW (Gallons)	CUMULATIVE TOTAL (Gallons)
12/14/07	162,326,759	147,670.0	191,610
12/17/07	162,394,909	68,150.0	68,150
12/18/07	162,585,079	190,170.0	258,320
12/19/07	162,828,319	243,240.0	501,560
12/20/07	162,920,699	92,380.0	593,940
01/02/08	163,094,798	174,099.0	768,039
01/03/08	163,268,368	173,570.0	941,609
01/04/08	163,472,938	204,570.0	1,146,179
01/07/08	163,662,638	189,700.0	1,335,879
01/08/08	163,841,398	178,760.0	1,514,639
01/09/08	164,025,248	183,850.0	1,698,489
01/10/08	164,205,098	179,850.0	1,878,339
01/11/08	164,367,438	162,340.0	2,040,679
01/14/08	164,451,778	84,340.0	2,125,019
01/15/08	164,618,908	167,130.0	2,292,149
01/16/08	164,816,508	197,600.0	2,489,749
01/17/08	165,002,128	185,620.0	2,675,369
01/18/08	165,201,388	199,260.0	2,874,629
01/18/08	165,231,438	30,050.0	2,904,679
01/20/08	165,262,608	31,170.0	2,935,849
01/21/08	165,276,598	13,990.0	2,949,839
01/22/08	165,443,138	166,540.0	3,116,379
01/23/08	165,631,998	188,860.0	3,305,239
01/24/08	165,796,948	164,950.0	3,470,189
01/25/08	165,956,568	159,620.0	3,629,809
01/28/08	166,024,928	68,360.0	3,698,169
01/29/08	166,201,308	176,380.0	3,874,549
01/30/08	166,397,438	196,130.0	4,070,679
01/31/08	166,619,258	221,820.0	4,292,499
02/01/08	166,802,538	183,280.0	4,475,779
02/04/08	167,019,508	216,970.0	4,692,749
02/05/08	167,179,288	159,780.0	4,852,529
02/06/08	167,348,998	169,710.0	5,022,239
02/07/08	167,507,028	158,030.0	5,180,269
02/11/08	167,938,198	431,170.0	5,611,439
02/12/08	168,101,898	163,700.0	5,775,139
02/13/08	168,272,788	170,890.0	5,946,029
02/14/08	168,468,148	195,360.0	6,141,389
02/15/08	168,618,268	150,120.0	6,291,509
02/18/08	168,795,068	176,800.0	6,468,309
02/19/08	168,948,838	153,770.0	6,622,079
02/20/08	169,156,848	208,010.0	6,830,089
02/21/08	169,352,838	195,990.0	7,026,079
02/22/08	169,523,508	170,670.0	7,196,749

**TABLE 2  
UIC MONITORING  
DAILY PROCESS WASTE WATER FLOW VOLUMES  
FEBRUARY 2008**

Charbert Facility  
Richmond, Rhode Island

DATE	MAG METER READING (Gallons)	MAG METER FLOW (Gallons)	CUMULATIVE TOTAL (Gallons)
02/25/08	169,734,088	210,580.0	7,407,329
02/26/08	169,887,698	153,610.0	7,560,939
02/27/08	170,020,048	132,350.0	7,693,289
02/28/08	170,180,998	160,950.0	7,854,239
02/29/08	170,351,778	170,780.0	8,025,019
03/03/08	170,431,708	79,930.0	8,104,949
03/04/08	170,596,798	165,090.0	8,270,039
03/05/08	170,779,598	182,800.0	8,452,839
03/06/08	170,924,608	145,010.0	8,597,849
03/07/08	171,040,358	115,750.0	8,713,599
03/10/08	171,111,728	71,370.0	8,784,969
03/11/08	171,160,148	48,420.0	8,833,389
03/12/08	171,184,308	24,160.0	8,857,549
03/13/08	171,211,978	27,670.0	8,885,219
03/14/08	171,234,858	22,880.0	8,908,099
03/17/08	171,276,208	41,350.0	8,949,449
Total Pumped this Quarter ( December 14, 2007 to March 17, 2008) by the Mag Meter			8,949,449 Gallons

**TABLE 3  
UIC MONITORING  
LAGOON INFLUENT SCHEDULE AND MAINTENANCE SCHEDULES  
DECEMBER 2007**

Charbert Facility  
Richmond, Rhode Island

LAGOON INFLUENT SCHEDULE			
DATE	RECEIVING LAGOON	CHANGED TO LAGOON	REMARKS
January 2007 to March 2008	1	No Change	All industrial waste water is discharged to Lagoon 1. Lagoon 1 is used as a settling pond, waste water is then transferred by an electric powered pump from Lagoon 1 to Lagoon 2. A second electric powered pump transfers waste water from Lagoon 2 to Lagoon 3.
January 2006 to January 2007	1	No Change	All industrial waste water is discharged to Lagoon 1. Lagoon 1 is used as a settling pond, waste water is then pumped by a electric powered pump from Lagoon 1 to Lagoon 2. A second electric powered pump transfers waste water from Lagoon 2 to Lagoon 3.
December 2005 to January 2006	1	No Change	An electric powered pump was installed to transfer industrial waste water from Lagoon 1 to Lagoon 2. A diesel powered pump transfers waste water from Lagoon 2 to Lagoon 3.
LAGOON MAINTENANCE SCHEDULE			
Date	Remarks		
Lagoon 1	There was no significant lagoon maintenance performed this quarter.		
Lagoon 2	There was no significant lagoon maintenance performed this quarter.		
Lagoon 3	There was no significant lagoon maintenance performed this quarter.		
MONITORING WELL MAINTENANCE			
Well ID	Date	Remarks	
MW-1A (GP-29)		Required No Maintenance	
MW-2A		Required No Maintenance	
MW-3 (RIZ-15)		Required No Maintenance	
MW-4A		Required No Maintenance	
MW-5B		Required No Maintenance	
MW-6 (RIZ-20)		Required No Maintenance	

**ATTACHMENT A**  
**LOW FLOW SAMPLING LOGS**

LOW FLOW GROUNDWATER SAMPLING LOG

Charbert Facility  
Richmond, Rhode Island

LOCATION: Charbert DATE: Monday, February 21, 2008  
 GZA JOB NO.: 32795.33 WELL ID: M/W-1A (GP-29)  
 WEATHER: Clear AIR TEMP (°F): 25  
 PUMP TYPE: Peristaltic DATUM: 65.90 TOP OF PVC ELEVATION  
 SAMPLED BY: EMB TOP OF CASING ELEVATION

WELL DEPTH (FT): 30.65 LENGTH OF WATER COLUMN (FT): 11.55  
 WATER DEPTH (FT): 19.1 WELL DIAMETER: 2"  
 UPPER PRODUCT LAYER (FT): NA WELL VOLUME: LITERS 7.13  
 LOWER PRODUCT LAYER (FT): NA  
 2" WELL = 0.183 GALLONS /FT WATER = 0.617 LITERS/FT  
 1" WELL = 0.013 GALLONS /FT WATER = 0.0482 LITERS/FT

FLOW RATE CALCULATIONS: START FLOW 14:20  
 VOLUME: 0.25 Liters SAMPLE TIME: 14:55  
 START TIME 0:00 DELTA TIME (MIN): 35  
 END TIME 34 Seconds FLOW RATE: (L/min) 0.22  
 MINIMUM PURGE TIME (MINUTES): 32.3 WELL DRAW DOWN (FT): 19.1 Flow Depth  
 VOLUME PURGED (Liters): 7.7 0 Drawdown

TIME	ORP (mV)	pH (SU)	COND (mS/cm)	TURB (NTU)	DO (mg/L)	TEMP (°C)
14:51	-80	4.6	0.802	0.0	1.6	9.9
14:53	-80	4.6	0.800	0.0	1.6	10
14:55	-80	4.5	0.798	0.0	1.6	10

COLOR: None WELL LOCKED YES X  
 ODOR: Light Chemical NO \_\_\_\_\_

NOTES: pH Meter appears to be reading low, values used for stabilization only.  
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GUIDELINES:  
 TURBIDITY < 5NTU AND +/-10 %  
 ORP +/- 10 mV  
 DO 10%  
 TEMP 3%  
 SPEC COND 3%  
 pH +/- 0.10 UNITS

LOW FLOW GROUNDWATER SAMPLING LOG

Charbert Facility  
Richmond, Rhode Island

LOCATION: Charbert DATE: Thursday, February 21, 2008  
 GZA JOB NO.: 32795.33 WELL ID: MW-2A  
 WEATHER: Clear AIR TEMP (°F): 25  
 PUMP TYPE: Peristaltic DATUM: 63.59 TOP OF PVC ELEVATION  
 SAMPLED BY: EMB TOP OF CASING ELEVATION

WELL DEPTH (FT): 19.98 LENGTH OF WATER COLUMN (FT): 12  
 WATER DEPTH (FT): 7.98 WELL DIAMETER: 2"  
 UPPER PRODUCT LAYER (FT): NA WELL VOLUME: LITERS 7.40  
 LOWER PRODUCT LAYER (FT): NA  
 2" WELL = 0.163 GALLONS /FT WATER = 0.617 LITERS/FT  
 1" WELL = 0.013 GALLONS /FT WATER = 0.0492 LITERS/FT

FLOW RATE CALCULATIONS: START FLOW 13:25  
 VOLUME: 0.25 Liters SAMPLE TIME: 14:05  
 START TIME 0:0 DELTA TIME (MIN): 40  
 END TIME 37 Seconds FLOW RATE: (L/min) 0.20  
 MINIMUM PURGE TIME (MINUTES): 36.5 WELL DRAW DOWN (FT): 8.07 Flow Depth  
 VOLUME PURGED (Liters): 8.1 -0.09 Drawdown

TIME	ORP (mV)	pH (SU)	COND (mS/cm)	TURB (NTU)	DO (mg/L)	TEMP (°C)
14:01	-111	3.9	0.885	0	0.7	9.2
14:03	-112	3.9	0.886	0	0.7	9.1
14:05	-112	3.9	0.863	0	0.7	9.1

COLOR: None WELL LOCKED YES X  
 OOR: Light chemical NO \_\_\_\_\_

NOTES: pH Meter appears to be reading low, values used for stabilization only.  
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**GUIDELINES:**  
 TURBIDITY <5 NTU AND +/-10 %  
 ORP +/- 10 mV  
 DO 10%  
 TEMP 3%  
 SPEC COND 3%  
 pH +/- 0.10 UNITS

LOW FLOW GROUNDWATER SAMPLING LOG

Charbert Facility  
Richmond, Rhode Island

LOCATION: Charbert DATE: Thursday, February 21, 2008  
 GZA JOB NO.: 32795.33 WELL ID: MW-3 (RIZ-15)  
 WEATHER: Clear AIR TEMP (°F): 25  
 PUMP TYPE: Peristaltic DATUM: 62.51 TOP OF PVC ELEVATION  
 SAMPLED BY: EMB TOP OF CASING ELEVATION

WELL DEPTH (FT): 21.85 LENGTH OF WATER COLUMN (FT): 10.12  
 WATER DEPTH (FT): 11.73 WELL DIAMETER: 2"  
 UPPER PRODUCT LAYER (FT): NA WELL VOLUME: LITERS 6.24  
 LOWER PRODUCT LAYER (FT): NA 2" WELL = 0.163 GALLONS /FT WATER = 0.617 LITERS/FT  
 1" WELL = 0.013 GALLONS /FT WATER = 0.0492 LITERS/FT

FLOW RATE CALCULATIONS: START FLOW 11:10  
 VOLUME: 0.25 Liters SAMPLE TIME: 11:40  
 START TIME 0.0 DELTA TIME (MIN): 30  
 END TIME 32 Seconds FLOW RATE: (L/min) 0.23  
 MINIMUM PURGE TIME (MINUTES): 26.8 WELL DRAW DOWN (FT): 11.75 Flow Depth  
 VOLUME PURGED (Liters): 7.0 -0.02 Drawdown

TIME	ORP (mV)	pH (SU)	COND (mS/cm)	TURB (NTU)	DO (mg/L)	TEMP (°C)
11:36	157	3.9	0.161	0	4.4	12.1
11:38	142	4.0	0.159	0	4.3	12.1
11:40	142	4.0	0.159	0	4.3	12.1

COLOR: None WELL LOCKED YES X  
 ODOR: Chemical NO \_\_\_\_\_

NOTES: pH Meter appears to be reading low, values used for stabilization only.  
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GUIDELINES:  
 TURBIDITY <5 NTU AND +/-10 %  
 ORP +/- 10 mV  
 DO 10%  
 TEMP 3%  
 SPEC COND 3%  
 pH +/- 0.10 UNITS

LOW FLOW GROUNDWATER SAMPLING LOG

Charbert Facility  
Richmond, Rhode Island

LOCATION: Charbert DATE: Thursday, February 21, 2008  
 GZA JOB NO.: 32795.33 WELL ID: MW-4A  
 WEATHER: Clear AIR TEMP (°F): 25  
 PUMP TYPE: Peristaltic DATUM: 58.43 TOP OF PVC ELEVATION  
 SAMPLED BY: EMB TOP OF CASING ELEVATION

WELL DEPTH (FT): 14.20 LENGTH OF WATER COLUMN (FT): 7.59  
 WATER DEPTH (FT): 6.61 WELL DIAMETER: 2"  
 UPPER PRODUCT LAYER (FT): NA WELL VOLUME: LITERS 4.68  
 LOWER PRODUCT LAYER (FT): NA 2" WELL = 0.163 GALLONS /FT WATER = 0.617 LITERS/FT  
 1" WELL = 0.013 GALLONS /FT WATER = 0.0492 LITERS/FT

FLOW RATE CALCULATIONS: START FLOW 11:40  
 VOLUME: 0.25 Liters SAMPLE TIME: 12:15  
 START TIME 0.0 DELTA TIME (MIN): 35  
 END TIME 42 Seconds FLOW RATE: (L/min) 0.18  
 MINIMUM PURGE TIME (MINUTES): 26.2 WELL DRAW DOWN (FT): 6.69 Flow Depth  
 VOLUME PURGED (Liters): 6.3 -0.08 Drawdown

TIME	ORP (mV)	pH (SU)	COND (mS/cm)	TURB (NTU)	DO (mg/L)	TEMP (°C)
12:11	-9	3.9	0.858	0	2.6	12.4
12:13	-8	3.9	0.840	0	2.6	12.5
12:15	-8	3.9	0.639	0	2.5	12.5

COLOR: None WELL LOCKED YES X  
 ODOR: Light Chemical NO \_\_\_\_\_

NOTES: pH Meter appears to be reading low, values used for stabilization only.  
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**GUIDELINES:**  
 TURBIDITY <5 NTU AND +/-10 %  
 ORP +/- 10 mV  
 DO 10%  
 TEMP 3%  
 SPEC COND 3%  
 pH +/- 0.10 UNITS

LOW FLOW GROUNDWATER SAMPLING LOG

Charbert Facility  
Richmond, Rhode Island

LOCATION: Charbert DATE: Thursday, February 21, 2008  
 GZA JOB NO.: 32795.33 WELL ID: MW-5B (GP-30)  
 WEATHER: Clear AIR TEMP (°F): 25  
 PUMP TYPE: Peristaltic DATUM: 63.16 TOP OF PVC ELEVATION  
 SAMPLED BY: EMB TOP OF CASING ELEVATION

WELL DEPTH (FT): 23.14 LENGTH OF WATER COLUMN (FT): 11.74  
 WATER DEPTH (FT): 11.4 WELL DIAMETER: 2"  
 UPPER PRODUCT LAYER (FT): NA WELL VOLUME: LITERS 7.24  
 LOWER PRODUCT LAYER (FT): NA  
 2" WELL = 0.163 GALLONS /FT WATER = 0.617 LITERS/FT  
 1" WELL = 0.013 GALLONS /FT WATER = 0.0492 LITERS/FT

FLOW RATE CALCULATIONS: START FLOW 12:10  
 VOLUME: 0.25 Liters SAMPLE TIME: 12:45  
 START TIME 0.0 DELTA TIME (MIN): 35  
 END TIME 35 Seconds FLOW RATE: (L/min) 0.21  
 MINIMUM PURGE TIME (MINUTES): 34.8 WELL DRAW DOWN (FT): 11.42 Flow Depth  
 VOLUME PURGED (Liters): 7.3 -0.02 Drawdown

TIME	ORP (mV)	pH (SU)	COND (mS/cm)	TURB (NTU)	DO (mg/L)	TEMP (°C)
12:41	-8	3.8	0.485	0	3.5	11.6
12:43	-20	3.8	0.483	0	3.2	11.7
12:45	-20	3.8	0.479	0	3.2	11.7

COLOR: None WELL LOCKED YES X  
 ODOR: None NO \_\_\_\_\_

NOTES: pH Meter appears to be reading low, values used for stabilization only.  
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**GUIDELINES:**  
 TURBIDITY <5 NTU AND +/-10 %  
 ORP +/- 10 mV  
 DO 10%  
 TEMP 3%  
 SPEC COND 3%  
 pH +/- 0.10 UNITS

LOW FLOW GROUNDWATER SAMPLING LOG

Charbert Facility  
Richmond, Rhode Island

LOCATION: Charbert DATE: Thursday, February 21, 2008  
 GZA JOB NO.: 32795.33 WELL ID: MW-6 (RIZ-20)  
 WEATHER: Clear AIR TEMP (°F): 25  
 PUMP TYPE: Peristaltic DATUM: 60.79 TOP OF PVC ELEVATION  
 SAMPLED BY: EMB TOP OF CASING ELEVATION

WELL DEPTH (FT): 21.10 LENGTH OF WATER COLUMN (FT): 8.94  
 WATER DEPTH (FT): 12.16 WELL DIAMETER: 2"  
 UPPER PRODUCT LAYER (FT): NA WELL VOLUME: LITERS 5.52  
 LOWER PRODUCT LAYER (FT): NA 2" WELL = 0.163 GALLONS /FT WATER = 0.617 LITERS/FT  
 1" WELL = 0.013 GALLONS /FT WATER = 0.0492 LITERS/FT

FLOW RATE CALCULATIONS: START FLOW 10:25  
 VOLUME: 0.25 Liters SAMPLE TIME: 10:50  
 START TIME 0.0 DELTA TIME (MIN): 25  
 END TIME 33 Seconds FLOW RATE: (L/min) 0.23  
 MINIMUM PURGE TIME (MINUTES): 24.3 WELL DRAW DOWN (FT): 12.23 Flow Depth  
 VOLUME PURGED (Liters): 5.7 -0.07 Drawdown

TIME	ORP (mV)	pH (SU)	COND (mS/cm)	TURB (NTU)	DO (mg/L)	TEMP (°C)
10:46	272	4.0	0.171	1.1	3.8	12.7
10:46	272	4.0	0.170	0.0	3.4	12.5
10:50	272	4.0	0.169	0.0	3.3	12.5

COLOR: None WELL LOCKED YES X  
 ODOR: Light chemical odor NO \_\_\_\_\_

NOTES: pH Meter appears to be reading low, values used for stabilization only.  
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GUIDELINES:  
 TURBIDITY <5 NTU AND +/- 10 %  
 ORP +/- 10 mV  
 DO 10%  
 TEMP 3%  
 SPEC COND 3%  
 pH +/- 0.10 UNITS