GZA
GeoEnvironmental, Inc.

Engineers and Scientists

January 12, 2007
File No. 32795.08-c

Ms. Terry Simpson
Principal Environmental Scientist
Office of Water Resources
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908

Re: Response to RIDEM's May 12, 2006 comments on RIBS Proposal
Charbert, Division of NFA Corp.

Dear Ms. Simpson:

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On behalf of Charbert, Division of NFA Corp., GZA GeoEnvironmental, Inc. (GZA), is pleased to provide these responses to the Rhode Island Department of Environmental Management's (RIDEM) May 12, 2006 comments on Charbert's April 14, 2006 proposal to construct rapid infiltration beds (RIBs) for the disposal of process wastewater at Charbert's facility in Richmond, Rhode Island. As first discussed at our meeting of March 23, 2006, Charbert's proposal seeks to construct two rapid infiltration beds (RIBs) now so that it can close out and restore the holding pond (Lagoon No. 4), and so that Charbert will be able to more aggressively manage water levels in the existing lagoons while Charbert works to complete its evaluation of a wastewater treatment alternatives.

As set forth in its April 14, 2006, proposal, Charbert plans to construct the two south RIBs (designated Area 1 on Figure 2) and use these RIBs to discharge water from Lagoon No. 3. When these south RIBS are operational, Charbert will then restore that portion of Lagoon No. 4 that lies within the 200-foot riverbank wetland. The remaining RIBs would then be constructed as part of Charbert's implementation of its full wastewater treatment system, after receiving all RIDEM approvals.

This proposed sequential construction of the RIBs, i.e., constructing the south RIBs now and the remaining RIBs when the evaluation of the wastewater treatment options is completed, will allow Charbert to maintain the existing Lagoons at a lower elevation and restore that potion of Lagoon No. 4 located in the 200-foot riverbank wetland. These proposed actions would greatly reduce the risk of a release of water from the Lagoons caused by high surface water elevations, high ground water elevations and seasonal intense rain events.

We have set out each of RIDEM's comments below by number, followed by Charbert's response.

GENERAL COMMENTS:

RIDEM'S Comment No. 1

The last sentence, bottom of page 1 states "These proposed RIBs are a part of the wastewater treatment options Charbert is currently evaluating and would be used for disposal of treated wastewater when the treatment plant is constructed." As discussed in the March 23, 2006 meeting between representatives of Charbert and its consultant GZA and Acheron, and the Department, it is the Department's understanding that the two proposed RIBs are part of a long-term plan for wastewater treatment and disposal that includes the creation of a wastewater treatment plant and a larger series of RIBs. Please provide as much detail as possible with regards to the completion, and how the two proposed RIBs fit into the plan.

Response to Comment No. 1

Charbert has spent significant time and resources since July 2004 to evaluate long-term industrial wastewater treatment and disposal options. The objective of this evaluation is to have a treatment method with a minimum potential to generate odors and that also provides an acceptable quality effluent with the potential to reuse some portion of the treated water.

Charbert has operated and evaluated two treatment options to determine their feasibility for Charbert's wastewater. Each are discussed below.

Activate Sludge Pilot Plant

The activated sludge pilot plant has been in operation since June 2005, and was able to produce an acceptable effluent during February and March of 2006. After many trials, we found that the activated sludge plant was able to effectively treat the wastewater once a 12-day equalization tank was used. This large equalization tank was successful in providing a buffer between the activated sludge and the weekly changes that occur in the wastewater characteristics. However, the data from the pilot plant indicated that a full-scale treatment plant based on that data was not cost effective. The influent rate into the activated sludge pilot plant was slowly increased over a period of weeks to evaluate the ability to treat the industrial wastewater with a shorter residence time in the aeration tank. A shorter residence time would result in a more cost effective treatment plant.

The activated sludge pilot plant has only been able to treat the wastewater to acceptable levels for a few days at a time at higher flow rates before being upset and suffering a significant reduction in treatment level. During the evaluation of the pilot plant to determine the cause of these upsets water samples from the equalization tank were collected and tested for BOD. These data indicated that natural occurring bacteria had seeded the equalization tank and these bacteria were reducing the BOD level to a point that the activated sludge pilot plant did not have enough food to sustain the needed mass of bacteria to effectively treat the wastewater. In addition, the weekly 24-hour composite wastewater sampling results indicated a significant change in the BOD and COD in the wastewater.

These observed fluctuation in the characteristics of the wastewater had an adverse impact on both the activated sludge pilot plant and the biological activity in the equalization tank. These fluctuations resulted in a much reduced treatment level in both the activated sludge plant and the equalization tank.

The available data from the activated sludge treatment plant indicates that it would be unlikely that a full scale activated sludge treatment plant would be able to treat the wastewater to an acceptable level given the current fluctuations in the characteristics of the wastewater and the strong likely hood that bacteria in the equalization tank would consume BOD resulting in a stress to the activated sludge plant.

The activated sludge pilot plant is still running while Charbert undertakes a review of the amount and types of chemicals used in the dye and finishing processes to determine their compatibility to biological treatment. Charbert is evaluating the cause in the fluctuations in the wastewater characteristics and the ability to decrease the size of the equalization tank. More consistent wastewater characteristics should help in the performance of an activated sludge treatment plant and a smaller equalization tank should reduce the ability of bacteria to reduce the BOD for the activated sludge plant.

Aerated Ponds

Charbert started a second pilot plant, simulating aerated ponds, in May 2006. Charbert decided to start an aerated pond pilot in part due to the inability to maintain the activated sludge pilot plant at an acceptable treatment level, and after reviewing data comparing the wastewater quality in Lagoon No. 3 compared to Lagoon No. 1.

This wastewater quality monitoring data from Lagoon No.3 showed that a significant level of treatment is occurring as the wastewater is moved sequentially from Lagoon No. 1 to Lagoon No. 3. The residence time for the wastewater to move through the three lagoons is estimated to be about 30 days. The aerated pond pilot plant mimics the current lagoon system holding time of 30 days but with a higher dissolved oxygen level. Based on the data, a higher dissolved oxygen level should result in an increase in the level of treatment of the wastewater and produce a better quality effluent. However, due to the long retention time required for this type of treatment method, data from this pilot plant requires longer to gather.

The aerated pond treatment method is currently producing a good quality effluent and has not suffered from the frequent upsets that the activated sludge pilot plant has experienced. This is encouraging and Charbert is continuing with the evaluation of this treatment method.

As set forth in detail in its September 6, 2005, Wastewater Alternatives Report, whichever treatment method is used, Charbert will also need a method for the disposal of the treated wastewater. That report described Charbert's evaluation of both surface water discharges, and surface disposal through a series of rapid infiltration basins or RIBs, and proposed the RIBS as its preferred disposal method.

After an extensive geologic and hydrogeologic evaluation of the subsurface conditions in the areas around the existing Lagoons it has been decided that RIBs would be used for future disposal of treated wastewater.

RIBs are constructed by first removing the topsoil and subsoil in the area of the RIB. The area is then graded flat and level using clean sand. A distribution pipe is installed usually in the center of RIB for discharge of the treated wastewater. The area of the RIB is then enclosed by a low berm usually about 18 to 24 inches high to protect the sand surface from blowing leaves and people from walking or driving on the sand surface.

Treated wastewater is intermittently pumping into the RIB where it soaks into the ground. The RIBs are not designed to hold standing water like a lagoon but simply to hold the water within the RIB area while the water soaks into the ground. In this way the RIBs spend most of the time in a dry condition with the exception of the time it takes to pump water into the RIB.

As the water migrates or percolates through the underlying sand, additional treatment occurs that removes suspended solids and further lowers the BOD and suspended solids in the treated wastewater.

The RIBs disposal method is a common element to all of the treatment options being evaluated at Charbert. The RIBs would be constructed around the perimeter of the existing lagoons as presented on Figures 1 and 2.

The design of the treatment plant will occur after the evaluation of the pilot treatment plants is complete. The best estimate at this time is that the aerated pond pilot plant will have to run through the winter to determine if the cold weather will have any significant impact on the level of treatment. During this time Charbert will continue to investigate the cause of the fluctuations in the wastewater characteristics that are believed to be responsible for the upsets in the activated sludge pilot plant and the ability to decrease the size of the equalization tank. A smaller equalization tank would reduce the potential for significant pretreatment to occur in the equalization tank, which the pilot plant evaluation indicates has a large detrimental impact on the ability of the activated sludge treatment plant to operate effectively.

RIDEM'S Comment No. 2

To date the Department has received three varying proposals for the installation of Rapid Infiltration Beds (RIBs) to be used for the discharge of process wastewater at the Charbert Facility. The first proposal, "Background Information, Modification of UIC Order of Approval, Charbert Facility, Richmond, Rhode Island", dated January 21, 2005 proposed the installation of four RIBs (each 50 ft X 150 ft X 4 ft deep for a total of 30,000 ft^2) to be installed side by side south of existing lagoon #3. Additionally, the four proposed RIBs were to be used for temporary storage of treated wastewater during the cold winter months, when the cold temperatures might result in less effective infiltration of wastewater through the RIBs.

The second proposal, "Hydrogeologic Study, Charbert Facility, Alton, Rhode Island" dated March 21, 2006 proposed the installation of three RIBs (Area 1, 300 ft X 80 ft, south of lagoon #3; Area 2, 600 ft X 40 ft, west of the lagoons; and Area 3, 250 ft X 50 ft, east of the lagoons, for a total of 60,500 ft^2). Additionally, it was recommended that lagoon #3 be kept available for backup and additional infiltration capacity.

The third and most recent proposal, "Proposal to Construct a Rapid Infiltration Bed for the Disposal of Process Wastewater, Charbert Division of NFA Corp., Alton, Rhode Island", dated April 14, 2006 proposes the installation of two RIBs south of lagoon #3 (each 2 ft deep with a total leaching area of 65,000 square feet) and the continued utilization of lagoons #1, #2 and #3. Please explain why the design of the RIBs has changed frequently over the past 15 months? Why has the most recent design been chosen? What advantages does the most recent design have over its predecessors? Why is the plan now to keep all three current lagoons active?

Response to Comment No. 2

The final proposed primary and reserve RIB areas are shown on the attached figures. They have been configured based on the Hydrologic Study completed by GZA in March 2006; and discussions with facility personnel regarding potential future operation changes at the facility. This configuration is essentially the same as the second proposal with areas of the third proposal included as reserve area. The first proposal (January 21, 2005) was a preliminary document prepared to facilitate discussions with RIDEM and the treatment plant designers and was developed prior to the detailed hydrologic study. The current proposal, reflected in the attached figures, represents the best use of the higher capacity leaching areas identified in the March 2006 Hydrologic Study and provides Charbert with flexibility to expand the disposal areas.

This proposal also allows Charbert the ability to permanently restore that portion of Lagoon 4 within the 200-foot wetland buffer to an upland wetland. It also gives Charbert the ability to more effectively manage wastewater during periods of significant rainfall and seasonal high groundwater using the RIB disposal technology which will be incorporated into the final wastewater treatment system design.

RIDEM'S Comment No. 3

Please provide two updated site plans. The first site plan should be similar to Figure No. 4 submitted with the March 21, 2006 "Hydrogeologic Study", but must also include: the two RIBs proposed in the April 14, 2006 proposal, seasonal high groundwater table, groundwater flow direction and existing and proposed contours. The second site plan should show the entire Charbert property including facility buildings, process well, public well, all on and off site monitoring wells, existing lagoons and temporary holding pond, proposed RIBs, on-site ISDS, groundwater flow, abutting roadways, private residences south of Church Street, private residence drinking water well locations, and Wood and Pawcatuck Rivers.

Response to Comment No. 3

The two requested site plans are attached and designated Figures 1 and 2. The primary (designated Areas 1 thru 3) and reserve (designated as Reserve Infiltration Areas) RIB areas have been reconfigured as described in our response to Comment #2, above.

RIDEM'S Comment No. 4

Provide the expected peak ground water mound elevation beneath each of the two RIBs based on the estimated discharge rate of 1.8 gallons per day per square foot of area.

Response to Comment No. 4

The final proposed primary RIB configuration and associated site grading is shown on Figure 2, attached. The proposed area is consistent with the areas evaluated as part of our March 2006 Hydrologic Study Report. The anticipated maximum daily loading to Area 1 is 120,000 gallons per day (gpd) and will result in a maximum groundwater mound of 10.5 feet beneath the center of the area (maximum mound elevation of 61.5). More detail is provided in Section 5 of the March 2006 Hydrologic Study Report.

Note, the Hydrologic Study Report demonstrated that Area 1 had a capacity greater than 5 gallons per day per square foot (i.e., 120,000 gpd over the 24,000 ft^2 area). At this time Charbert is requesting to apply only 45,000 to 50,000 gpd to Area 1, or a loading rate of approximately 2 gpd/ft^2, which will result in a significantly lower mound.

Additional reserve and expansion areas to the south, west, and east of the lagoons are also shown on Figure 2. These areas may be developed pending facility wastewater disposal needs.

RIDEM'S Comment No. 5

What if any, are the anticipated impacts to water quality of the Wood and Pawcatuck Rivers from use of the proposed RIBs.

Response to Comment No. 5

The three existing waste water disposal lagoons (i.e., Lagoons 1 thru 3) have been in operation since the late 1970s and receive untreated wastewater, so treating this untreated wastewater would improve the water quality. A study of water quality of the Wood and Pawcutuck Rivers was completed by Microinorganics, Inc. of Narragansett, Rhode Island in January of 2005 on behalf of GZA. That study (copy attached) evaluated river water quality at locations on the Wood River (the primary receptor of groundwater from the area of the existing lagoons as well as the proposed RIBs) both upstream and downstream of the Charbert facility and lagoons. Based on our evaluation of the analytical results, there is no significant difference in surface water quality between the upstream and downstream samples. As such, for the metals evaluated (chromium, lead, copper, nickel and zinc), the facility is not having a measurable impact on water quality in the Wood River.

Table 1 provides a summary of quarterly groundwater monitoring in the vicinity of the active lagoons, conducted as part of the UIC Consent Order in 2006. These results support these findings and show that neither metals nor volatile organics are detected at concentrations above applicable GA Groundwater Objectives. Note the two wells in closest proximity to Lagoon No. 2 have show chromium at concentrations above the Preventative Action Limits (PALs) but below the GA Groundwater Objective.

Table 2 provides a summary of baseline groundwater characterization testing for a broad range of constituents in a shallow and deep well cluster installed immediately downgradient of the proposes Area 1 RIB. This testing yielded non-detectable results for VOCs, semi-volatile organics, and the majority of the target inorganics. Only chromium (8.0 µg/l), nitrate (580 µg/l), ammonia (2,300 to 6,400 µg/l) and total petroleum hydrocarbons (630 to 4,600 µg/l) were detected, and all at concentrations below applicable regulatory criteria. Monitoring well locations are show on Figures 1 and 2.

As discussed above, Charbert intends to discharge water from Lagoon No. 3 into the RIBs because analytical data indicates that the water in Lagoon No. 3 has a higher quality effluent than that currently being introduced to the groundwater aquifer through Lagoon Nos. 1 and 2. Also, refer to response to Comment 6 for a discussion of our evaluation of the mobility of chromium at the Charbert facility.

Based on the existing monitoring data and information presented, GZA believes that there will not be any deleterious impacts to the water quality of the Wood or Pawcatuck Rivers from the future operation of the RIBs assuming they are constructed and operated as proposed.

RIDEM'S Comment No. 6

Provide a proposal to address the elevated chromium levels found in the pumphouse effluent.

Response to Comment No. 6

The chromium concentration in the effluent from the pump house is approximately 0.2 mg/l, predominately in trivalent form. To address treatment of chromium, GZA conducted a literature review on the mobility of chromium in groundwater. The sources examined by GZA generally agreed that trivalent chromium is essentially immobile in soils, in particular under reducing conditions with pH below 7, due to sorption and precipitation processes. Trivalent chromium mobility is also a function of the aquifers oxidation reduction potential (ORP), with reducing conditions resulting in reduced mobility. The literature also indicates that under reducing conditions hexavalent chromium is permanently reduced to trivalent chromium. (Fetter 1999; Fruchter et al 2000; Nikolaidis et al 1994; Palmer and Puls 1994; Smith et al 1995; Stepniewska et al 2004; Stewert et al 2003). These references also indicate that desorption of chromium is very slow and the solubility of precipitates very low, limiting the potential of trivalent chromium leaching out from soils after precipitation (Davis et al 1993; Oakley and Korte 1996).

Groundwater monitoring results from Chabert show pH levels to be below 7, and show highly negative oxidation-reduction potential (ORP) levels in the vicinity of the lagoons. Negative ORP levels indicate reducing conditions. This shows, based on GZAs literature review, that subsurface conditions at Chabert render chromium in the discharged wastewater essentially immobile. Also, subsurface conditions at Chabert will tend to reduce highly toxic hexavalent chromium, if present, into less toxic and less mobile trivalent chromium. In addition, the risk of chromium leaching from soil at Chabert in the future is minimal.

Chromium testing from Chabert supports limited chromium transport. Detects of chromium in groundwater at Chabert are limited to wells within approximately 600 ft of the lagoons, in the direction of groundwater flow and have never exceeded Federal Safe Drinking Water Act MCLs. GZA conducted a three year mass balance of chromium, provided in Table 3. The mass balance shows approximately 70% of the chromium mass discharged from the pump house is retained in the first 2 feet of soil used as the lagoon filter media. In a three year period a relatively small amount of chromium is discharged from the pump house, approximately 400 pounds.

That being said, all of the wastewater treatment options being evaluated at Charbert are expected to result in some degree of chromium removal, which would lower the effluent concentration of chromium to groundwater.

References

Davis et al. Metals in Groundwater. Lewis Publishers Chelsea, MI. 1993.

Fetter, C.W. Contaminant Hydrology. Prentice Hall Upper Saddle River, NJ. 1999.

Fruchter et al. "Creation of a Subsurface Permeable Treatment Zone for Aqueous Chromate Contamination Using In Situ Redox Manipulation." GWMR, Spring 2000; pages 66-77.

Nikolaidis et al. "Vertical Distribution and Partitioning of Chromium in a Glaciofluvial Aquifer." GWMR, Summer 1994; pages 150-159.

Oakley, D., Korte, N.E. "Nickel and Chromium in Ground Water Samples as Influenced by Well Construction and Sampling Methods." GWMR, Winter 1996; pages 93-99.

Palmer, Carl D. and Puls, Robert W. "Ground Water Issue Natural Attenuation of Hexavalent Chromium in Ground Water and Soils". Environmental Protection Agency October 1994, Document Number EPA/540/S-94/505.

Smith et al. Remedial Options for Metals- Contaminated Sites. CRC Press Boca Raton, FL. 1995.

Stepniewska et al. "The Effects of MnO2 on Sorption and Oxidation of Cr(III) by Soils". GEODERMA, 122 (2004) pages 291-296.

Stewert et al. "Influence of Soil Geochemical and Physical Properties on the Sorption and Bioaccessibility of Chromium (III)

RIDEM'S Comment No. 7

Provide any information related to the analytical characterization of the soil and groundwater (shallow and deep) in the area of the proposed RIBs.

Response to Comment No. 7

See attached Tables 1 and 4 for groundwater testing results from wells GZ-5, 13, 14 and GP-20, -21 and -29 all of which are located in the general vicinity of the proposed RIBs as shown on Figure 2. Available soils testing results for borings GZ-5, GP-20, -21 and -29 are provided in Table 5. Note, all results are compliant with RIDEM's GA Groundwater Objectives and Residential Direct Exposure Criteria.

RIDEM'S Comment No. 8

Provide information on confirmed wetland delineation in the area of the proposed RIBs either by DEM, OC&I of Charbert consultants.

Response to Comment No. 8

Natural Resources Services of Burriville, Rhode Island in August 2004 performed a full wetland delineation. Wetland flags are shown on Figures 1 and 2, attached.

RIDEM'S Comment No. 9

Provide the Department with available case studies where RIBs have been utilized for the discharge of Industrial wastewater. This information should include a description of the waste stream (s) being discharged, any pre-treatment utilized prior to discharge, locations and surrounding areas where the RIBs are being used, system performance monitoring, and any other pertinent information that demonstration that this technology has been used successfully elsewhere and would be successful at this facility in its proposed location.

Response to Comment No. 9

RIBs are one form of wastewater disposal within the general heading of land application for treated wastewater. The use of RIBs and other types of land application systems as a viable means of disposal for treated wastewater is as old as wastewater treatment. In areas where the surficial geology is sandy, RIBs have always been and continue to be the preferred alternative for the disposal of treated wastewater.

The water quality standards for the treated wastewater used in land application systems must meet some groundwater quality standards at the end of the treatment system or at some groundwater monitoring point down-gradient of the land application system. Effluent and groundwater monitoring, as discussed in our response to Comment #10 below, are frequent requirements in permits for RIBs and other land application systems.

The sizing of RIBs is dependent on the water application rate, the quality of the water, the permeability of the underlying soils and groundwater mounding. Typically, a groundwater mounding analysis is required for any situations where the natural groundwater level is in proximity to the top of the RIBs, or where the application rate has the potential to create groundwater mounding. This study has been completed for the Charbert facility and is discussed in the response to Comment #4, above. The groundwater mounding analysis is used, in combination with other information, to establish a loading rate that will minimize the risk of having a groundwater mound under the RIB raise up to the surface level of the RIB. Most commonly, RIBs are designed for intermittent loading. The RIBs are designed so that one area can be loaded for some period of time and then allowed to rest while an alternative area is loaded. The loading and resting cycles are designed to prevent the groundwater mound from reaching the top of the RIB.

A case study specific to a Rhode Island application of the RIB technology for the disposal of domestic waste water is provided below:

> In Rhode Island, RIBs are being used at the Castle Rock condominium complex in Charlestown. Castle Rock consists of 145 two-bedroom condominium units. The complex is served by a private drinking water supply and an onsite sewage treatment plant. The plant has been in operation since the late 1970s, and its operation is authorized under a RIDEM Order of Approval. The system had been constructed for a design flow of 50,000 gpd, although average daily flows are observed at approximately 17,000 gpd, with a peak flow of 23,000 gpd. The quality of the water being treated is typical domestic sanitary wastewater. Average wastewater constituent concentrations are TSS of 53 mg/L, BOD5 of 82 mg/L COD of 220 mg/L, ammonia (as N) of 21 mg/L, and total phosphate (as P) of 4.3 mg/L.
>
> Effluent from the wastewater plant is pumped to the absorption field, which consists of four rapid infiltration beds. Each bed covers approximately 3,800 square feet (100' x 38') and is approximately three to four feet deep and lined with septic sand. Only one bed is used at any given time and flow is directed to a new bed every two to four weeks. Effluent is applied to the bed by a central trough that distributes the effluent down the center of the bed. Two of

the beds have recently been converted to a PVC pipe distribution system to provide more uniform distribution of the effluent throughout the bed.

Maintenance occurs on an as-needed basis and consists of cleaning the top of the bed of vegetation and any organic layer that develops. This is accomplished using a small gasoline powered rototiller, which effectively turns over the surface layer of sand. Standing water in a bed has rarely been a problem and occurs only when the bed has been run for several months without routine cleaning.

Rapid infiltration beds have been an effective means of treated wastewater disposal at Castle Rock Condominiums for over 35 years. There are no functional problems with the beds provided they are properly maintained.

Contact with the southeast region of the Massachusetts Department of Environmental Protection indicates that they have 50 to 60 RIB systems in place and being used for the disposal of sanitary waste water following treatment. They have indicated a similar experience with these systems with regard to performance longevity and maintenance as that described above for the Castle Rock example.

In summary, under the right circumstances, RIBs are a conventional and commonly used means of disposal for treated wastewater, and are considered by some to be an environmentally preferred alternative to surface water discharge.

RIDEM'S Comment No. 10

The number of wells proposed to monitor groundwater in the area of the RIBs appears inadequate. Please be aware that if this proposal and any associated modification progresses to approval, an adequate network of groundwater monitoring wells will be required to ensure protection of groundwater resources.

Response to Comment No. 10

Charbert recognizes that an appropriate groundwater monitoring network and testing program will be necessary. Figure No. 2 shows a proposed monitoring network consisting of eight new wells designated RCW-1 to RCW-8. These wells are all situated in downgradient areas with respect to the proposed RIBs and Reserve Infiltration Areas. This monitoring network may be modified based on the final approved RIB configuration and will be developed in concert with RIDEM. At this time we believe quarterly testing of volatile organic compounds and total and dissolved chromium is appropriate. Wells will be purged and sampled utilizing EPA's Low Stress/Low Flow procedure.

We trust that this information fulfills your present needs and look forward to discussing our responses. If you have any questions or comments please call Anthony Urbano or Edward Summerly at (401)-421-4140.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Anthony B. Urbano
Project Engineer

John P. Hartley
Consultant/Reviewer

Edward A. Summerly, P.G.
Associate Principal

EAS:glz

Attachments: Tables 1 to 5
Figures 1 to 3
Microinorganics, Inc. Surface Water Quality Report – January 2005

cc: D. Chopy, DEM, OC&I w/enclosures
C. Roy, DEM, OWR w/enclosures
Brian Wagner, Esq. w/o enclosures

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TABLE 1
UIC MONITORING DETECTED CONSTITUENTS
MARCH and JUNE 2006

Charbert Facility
Alton, Rhode Island

	RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	UNITS	MW-1A (GP-29) 05/31/2006		MW-2A 05/31/2006		MW-3 (RIZ-15) 05/31/2006		MW-4A 05/31/2006		MW-5B (GP-30) 05/31/2006		MW-6 (RIZ-20) 05/31/2006		TRIP BLANK 05/31/2006	
				Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit
VOLATILE ORGANICS																	
Acetone	NS	NS	ug/L (ppb)	<	25	<	25	<	25	<	25	<	25	<	25	<	25
cis-1,2-Dichloroethene	70	35	ug/L (ppb)	<	2	<	2	<	2	<	2	<	2	<	2	<	2
4-Methyl-2-Pentanone	NS	NS	ug/L (ppb)	13	2	13	2	<	2	<	2	<	2	<	2	<	2
Toluene	100	50	ug/L (ppb)	<	1	1.1	1	1.5	1	<	1	1.1	1	<	1	<	1
Tetrachloroethene	5	2.5	ug/L (ppb)	<	1	<	1	<	1	<	1	<	1	<	1	<	1
p-Isopropyltoluene	NS	NS	ug/L (ppb)	<	1	<	1	<	1	<	1	<	1	<	1	<	1
Naphthalene	100	50	ug/L (ppb)	<	1	1.3	1	<	1	<	1	<	1	<	1	<	1
RCRA METALS																	
Barium	5,500	10,000	ug/L (ppb)	NT		NT		NT		NT		NT		NT		NT	
Total Chromium	100	50	ug/L (ppb)	96	5	81	5	14	5	<	5	<	5	<	5	NT	
Dissolved Chromium	100	50	ug/L (ppb)	68	5	61	5	6	5	<	5	<	5	<	5	NT	

	RIDEM GA Groundwater Objectives	RIDEM Groundwater Quality PALs	UNITS	MW-1A (GP-29) 02/28/2006		MW-2A 02/28/2006		MW-3 (RIZ-15) 02/28/2006		MW-4A 02/28/2006		MW-5B (GP-30) 02/28/2006		MW-6 (RIZ-20) 02/28/2006	
				Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit
VOLATILE ORGANICS															
Acetone	NS	NS	ug/L (ppb)	<	25	<	25	<	25	<	25	<	25	<	25
Chloromethane	NS	NS	ug/L (ppb)	<	2	<	2	<	2	<	2	<	2	<	2
4-Methyl-2-Pentanone	NS	NS	ug/L (ppb)	<	2	10	2	<	2	<	2	<	2	<	2
Toluene	100	50	ug/L (ppb)	<	1	3.2	1	<	1	<	1	1.9	1	<	1
Tetrachloroethene	5	2.5	ug/L (ppb)	<	1	<	1	<	1	<	1	<	1	<	1
Naphthalene	100	50	ug/L (ppb)	<	1	1.4	1	<	1	<	1	<	1	<	1

< = NOT DETECTED
NT = NOT TESTED
NS = NO STANDARD
NOTE: Sample "PH" Total Petroleum Hydrocarbon Content Consist of Greater Than 75% Organosiloxanes

INDICATES DETECTED CONSTITUANT
INDICATES RIDEM GA EXCEEDANCE
INDICATES RIDEM PAL EXCEEDANCE

TABLE 2
SUMMARY OF RIB AREA BASELINE GROUNDWATER CHARACTERIZATION

Charbert Facility
Alton, Rhode Island

PARAMETERS		GZ-13 04/06/2006		GZ-14 04/06/2006		Equip. Blank 04/06/2006		Trip Blank 04/06/2006	
		Result	Limit	Result	Limit	Result	Limit	Result	Limit
VOLATILE ORGANICS									
Dichlorodifluoromethane	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
Chloromethane	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
Vinyl Chloride	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Bromomethane	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
Chloroethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Trichlorofluoromethane	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
Diethylether	ug/L (ppb)	<	5.0	<	5.0	<	5.0	<	5.0
Acetone	ug/L (ppb)	<	25	<	25	<	25	<	25
1,1-Dichloroethene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Dichloromethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Methyl-Tert-Butyl-Ether	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
trans-1,2-Dichloroethene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,1-Dichloroethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
2-Butanone	ug/L (ppb)	<	25	<	25	<	25	<	25
2,2-Dichloropropane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
cis-1,2-Dichloroethene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Chloroform	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Bromochloromethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Tetrahydrofaran	ug/L (ppb)	<	10	<	10	<	10	<	10
1,1,1-Trichloroethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,1-Dichloropropene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Carbon Tetrachloride	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dichloroethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Benzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Trichloroethene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dichloropropane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Bromodichloromethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Dibromomethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
4-Methyl-2-Pentanone	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
cis-1,3-Dichloropropene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Toluene	ug/L (ppb)	<	1.0	<	1.0	2.3	1.0	<	1.0
trans-1,3-Dichloropropene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,1,2-Trichloroethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
2-Hexanone	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
1,3-Dichloropropane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Tetrachloroethene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Dibromochloromethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dibromoethane (EDB)	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
Chlorobenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Ethylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
m&p-Xylene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
o-Xylene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Styrene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Bromoform	ug/L (ppb)	<	2.0	<	2.0	<	2.0	<	2.0
Isopropylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2,3-Trichloropropane	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Bromobenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
N-Propylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
2-Chlorotoluene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,3,5-Trimethylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
4-Chlorotoluene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
tert-Butylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2,4-Trimethylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
sec-Butylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0

TABLE 2
SUMMARY OF RIB AREA BASELINE GROUNDWATER CHARACTERIZATION

Charbert Facility
Alton, Rhode Island

PARAMETERS		GZ-13 04/06/2006		GZ-14 04/06/2006		Equip. Blank 04/06/2006		Trip Blank 04/06/2006	
		Result	Limit	Result	Limit	Result	Limit	Result	Limit
p-Isopropyltoluene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,3-Dichlorobenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,4-Dichlorobenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
n-Butylbenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dichlorobenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dibromo-3-Chloropropane	ug/L (ppb)	<	5.0	<	5.0	<	5.0	<	5.0
1,2,4-Trichlorobenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Hexachlorobutadiene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
Naphthalene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
1,2,3-Trichlorobenzene	ug/L (ppb)	<	1.0	<	1.0	<	1.0	<	1.0
SEMI-VOLATILE ORGANICS									
Phenol	ug/L	<	10	<	10				
2-Chlorophenol	ug/L	<	10	<	10				
2-Methylphenol	ug/L	<	10	<	10				
3&4-Methylphenol	ug/L	<	10	<	10				
2-Nitrophenol	ug/L	<	10	<	10				
2,4-Dimethylphenol	ug/L	<	10	<	10				
Benzoic Acid	ug/L	<	10	<	10				
2,4-Dichlorophenol	ug/L	<	10	<	10				
4-Chloro-3-Methylphenol	ug/L	<	20	<	20				
2,4,6-Trichlorophenol	ug/L	<	10	<	10				
2,4,5-Trichlorophenol	ug/L	<	10	<	10				
2,4-Dinitrophenol	ug/L	<	100	<	100				
4-Nitrophenol	ug/L	<	50	<	50				
4,6-Dinitro-2-Methylphenol	ug/L	<	50	<	50				
Pentachlorophenol	ug/L	<	50	<	50				
n-Nitrosodimethylamine	ug/L	<	10	<	10				
bis(2-Chloroethyl)Ether	ug/L	<	10	<	10				
1,3-Dichlorobenzene	ug/L	<	10	<	10				
1,4-Dichlorobenzene	ug/L	<	10	<	10				
Benzyl Alcohol	ug/L	<	20	<	20				
1,2-Dichlorobenzene	ug/L	<	10	<	10				
bis(2-Chloroisopropyl)Ether	ug/L	<	10	<	10				
n-Nitrosodi-n-Propylamine	ug/L	<	10	<	10				
Hexachloroethane	ug/L	<	10	<	10				
Nitrobenzene	ug/L	<	10	<	10				
Isophorone	ug/L	<	10	<	10				
bis(2-Chloroethoxy)Methane	ug/L	<	10	<	10				
1,2,4-Trichlorobenzene	ug/L	<	10	<	10				
Naphthalene	ug/L	<	2.0	<	2.0				
4-Chloroaniline	ug/L	<	20	<	20				
Hexachlorobutadiene	ug/L	<	10	<	10				
2-Methylnaphthalene	ug/L	<	2.0	<	2.0				
Hexachlorocyclopentadiene	ug/L	<	50	<	50				
2-Chloronaphthalene	ug/L	<	10	<	10				
2-Nitroaniline	ug/L	<	50	<	50				
Dimethylphthalate	ug/L	<	10	<	10				
Acenaphthylene	ug/L	<	2.0	<	2.0				
2,6-Dinitrotoluene	ug/L	<	10	<	10				
3-Nitroaniline	ug/L	<	50	<	50				
Acenaphthene	ug/L	<	2.0	<	2.0				
Dibenzofuran	ug/L	<	10	<	10				
2,4-Dinitrotoluene	ug/L	<	10	<	10				
Diethylphthalate	ug/L	<	10	<	10				
Fluorene	ug/L	<	2.0	<	2.0				
4-Chlorophenyl Phenyl Ether	ug/L	<	10	<	10				
4-Nitroaniline	ug/L	<	20	<	20				

TABLE 2
SUMMARY OF RIB AREA BASELINE GROUNDWATER CHARACTERIZATION

Charbert Facility
Alton, Rhode Island

PARAMETERS		GZ-13 04/06/2006		GZ-14 04/06/2006		Equip. Blank 04/06/2006		Trip Blank 04/06/2006	
		Result	Limit	Result	Limit	Result	Limit	Result	Limit
n-Nitrosodiphenylamine	ug/L	<	10	<	10				
4-Bromophenyl Phenyl Ether	ug/L	<	10	<	10				
Hexachlorobenzene	ug/L	<	10	<	10				
Phenanthrene	ug/L	<	2.0	<	2.0				
Anthracene	ug/L	<	2.0	<	2.0				
Carbazole	ug/L	<	10	<	10				
di-n-Butylphthalate	ug/L	<	15	<	15				
Fluoranthene	ug/L	<	2.0	<	2.0				
Pyrene	ug/L	<	2.0	<	2.0				
Butylbenzylphthalate	ug/L	<	10	<	10				
Benzo [a] Anthracene	ug/L	<	2.0	<	2.0				
3,3'-Dichlorobenzidine	ug/L	<	20	<	20				
Chrysene	ug/L	<	2.0	<	2.0				
bis(2-Ethylhexyl)Phthalate	ug/L	<	10	<	10				
di-n-Octylphthalate	ug/L	<	10	<	10				
Benzo [b] Fluoranthene	ug/L	<	2.0	<	2.0				
Benzo [k] Fluoranthene	ug/L	<	2.0	<	2.0				
Benzo [a] Pyrene	ug/L	<	2.0	<	2.0				
Indeno [1,2,3-cd] Pyrene	ug/L	<	2.0	<	2.0				
Dibenzo [a,h] Anthracene	ug/L	<	2.0	<	2.0				
Benzo [g,h,i] Perylene	ug/L	<	2.0	<	2.0				
TOTAL PETROLEUM HYDROCARBON									
Hydrocarbon Content	ug/L (ppb)	630	200	4600	200				
PRIORITY POLLUTANT METALS									
Silver	ug/L (ppb)	<	5.0	<	5.0	<	5.0		
Arsenic	ug/L (ppb)	<	10	<	10	<	10		
Beryllium	ug/L (ppb)	<	5.0	<	5.0	<	5.0		
Cadmium	ug/L (ppb)	<	5.0	<	5.0	<	5.0		
Chromium	ug/L (ppb)	<	5.0	8.0	5.0	<	5.0		
Copper	ug/L (ppb)	<	15	<	15	<	15		
Mercury	ug/L (ppb)	<	0.40	<	0.40	<	0.40		
Nickel	ug/L (ppb)	<	10	<	10	<	10		
Lead	ug/L (ppb)	<	10	<	10	<	10		
Antimony	ug/L (ppb)	<	25	<	25	<	25		
Selenium	ug/L (ppb)	<	25	<	25	<	25		
Thallium	ug/L (ppb)	<	25	<	25	<	25		
Zinc	ug/L (ppb)	<	10	<	10	<	10		
ANIONS - ION CHROMATOGRAPHY									
Nitrate	ug/L (ppb)	580	25	<	25				
Nitrite	ug/L (ppb)	<	25	<	25				
SUBCONTRACTED ANALYTES									
Ammonia	ug/L (ppb)	2300	100	6400	100				

TABLE 3

MASS BALANCE, CHROMIUM

Chabert Facility
Alton, Rhode Island

Surface Area, Lagoon 1	50,736	sq ft
Surface Area, Lagoon 2	54,490	sq ft
Surface Area, Lagoon 3	42,696	sq ft
Total	147,922	sq ft
Concentration of Chromium in Pump House	0.20	mg/l
Dissolved Concentration of Chromium in Groundwater Around Lagoons (Average of Wells MW-1A and MW-2A)	0.0645	mg/l
Average Wastewater Pumped per Day (Runs 6 days per week)	250,000 946,350	gallons liters
Wastewater Pumped, Three Years	885,783,600	liters
Chromium Mass Pumped Three Years	177,156,720	mg
Mass Chromium Dissolved Groundwater, Three Years	57,133,042 32	mg % of Total
Total Chromium as VI Concentration, Stock Piles Composite 2004	8.19	mg/kg
Assumed Unit Weight of Soil	110 50	lb/ft^3 kg/ft^3
Volume Dredged From Lagoons, Dredge Depth 2 ft, done every three years	295,843	ft^3
Mass of Chromium in Lagoon Scrapings	120,893,777 68	mg % of Total
Total Percent Mass Recovered	100	

Notes: 1. A three year interval was chosen because the lagoons are scraped and relined every three years.
2. Assumes 100% of Wastewater Pumped Infiltrates

TABLE 4

SUMMARY OF GZA's GROUNDWATER ANALYTICAL RESULTS FOR RIB AREA

Charbet Facility
Alton, Rhode Island

PARAMETERS	UNITS	RIDEM STANDARDS		GZ-5		GP-20		GP-21		GP 28	
		GA	PALs	2/24/2005		2/15/2005		2/15/2005		2/15/2005	
				Result	Limit	Result	Limit	Result	Limit	Result	Limit
VOLATILE ORGANICS											
1,1,1,2-Tetrachloroethane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,1,1-Trichloroethane	ug/L (ppb)	200	100	<	1.0	<	1.0	<	1.0	<	1.0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,1,2-Trichloroethane	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
1,1-Dichloroethane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,1-Dichloroethene	ug/L (ppb)	7	3.5	<	1.0	<	1.0	<	1.0	<	1.0
1,1-Dichloropropene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,2,3-Trichlorobenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,2,3-Trichloropropane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,2,4-Trichlorobenzene	ug/L (ppb)	70	35	<	1.0	<	1.0	<	1.0	<	1.0
1,2,4-Trimethylbenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dibromo-3-Chloropropane	ug/L (ppb)	0.2	0.1	<	5.0	<	5.0	<	5.0	<	5.0
1,2-Dibromoethane (EDB)	ug/L (ppb)	0.05	0.025	<	2.0	<	2.0	<	2.0	<	2.0
1,2-Dichlorobenzene	ug/L (ppb)	600	300	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dichloroethane	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
1,2-Dichloropropane	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
1,3,5-Trimethylbenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,3-Dichlorobenzene	ug/L (ppb)	600	300	<	1.0	<	1.0	<	1.0	<	1.0
1,3-Dichloropropane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
1,4-Dichlorobenzene	ug/L (ppb)	75	37.5	<	1.0	<	1.0	<	1.0	<	1.0
2,2-Dichloropropane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
2-Butanone	ug/L (ppb)	---	---	<	25	<	25	<	25	<	25
2-Chlorotoluene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
2-Hexanone	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
4-Chlorotoluene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
4-Methyl-2-Pentanone	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Acetone	ug/L (ppb)	---	---	<	25	<	25	<	25	140	25
Benzene	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
Bromobenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Bromochloromethane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Bromodichloromethane	ug/L (ppb)	100	50	<	1.0	<	1.0	<	1.0	<	1.0
Bromoform	ug/L (ppb)	100	50	<	2.0	<	2.0	<	2.0	<	2.0
Bromomethane	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Carbon Tetrachloride	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
Chlorobenzene	ug/L (ppb)	100	50	<	1.0	<	1.0	<	1.0	<	1.0
Chloroethane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Chloroform	ug/L (ppb)	100	50	<	1.0	<	1.0	<	1.0	<	1.0
Chloromethane	ug/L (ppb)	5	2.5	<	2.0	<	2.0	<	2.0	<	2.0
cis-1,2-Dichloroethene	ug/L (ppb)	70	35	<	1.0	<	1.0	<	1.0	<	1.0
cis-1,3-Dichloropropene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Dibromochloromethane	ug/L (ppb)	100	50	<	1.0	<	1.0	<	1.0	<	1.0
Dibromomethane	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Dichlorodifluoromethane	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Dichloromethane	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
Diethylether	ug/L (ppb)	---	---	<	5.0	<	5.0	<	5.0	<	5.0
Ethylbenzene	ug/L (ppb)	700	350	<	1.0	<	1.0	<	1.0	<	1.0
Hexachlorobutadiene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Isopropylbenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
m&p-Xylene	ug/L (ppb)	10000	5000	<	1.0	<	1.0	<	1.0	<	1.0
Methyl-Tert-Butyl Ether	ug/L (ppb)	40	20	<	1.0	<	1.0	<	1.0	<	1.0
Naphthalene	ug/L (ppb)	---	---	1.3	1.0	1.2	1.0	2.3	1.0	<	1.0
n-Butylbenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
N-Propylbenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
o-Xylene	ug/L (ppb)	10000	5000	<	1.0	<	1.0	<	1.0	<	1.0
p-Isopropyltoluene	ug/L (ppb)	---	---	<	1.0	1.5	1.0	<	1.0	<	1.0
sec-Butylbenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Styrene	ug/L (ppb)	100	50	<	1.0	<	1.0	<	1.0	<	1.0
tert-Butylbenzene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Tetrachloroethene	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
Tetrahydrofuran	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
Toluene	ug/L (ppb)	1000	500	14	1.0	<	1.0	1.9	1.0	<	1.0
trans-1,2-Dichloroethene	ug/L (ppb)	100	50	<	1.0	<	1.0	<	1.0	<	1.0
trans-1,3-Dichloropropene	ug/L (ppb)	---	---	<	1.0	<	1.0	<	1.0	<	1.0
Trichloroethene	ug/L (ppb)	5	2.5	<	1.0	<	1.0	<	1.0	<	1.0
Trichlorofluoromethane	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Vinyl Chloride	ug/L (ppb)	2	1	<	1.0	<	1.0	<	1.0	<	1.0
VOLATILE ORGANICS BY GC SCREEN											
Methane	ug/L (ppb)	---	---	NT	10	NT		NT		3,000	10
SEMI-VOLATILE ORGANICS ACID FRACTION:											
2,4,5-Trichlorophenol	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
2,4,6-Trichlorophenol	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
2,4-Dichlorophenol	ug/L (ppb)	---	---	<	50	<	10	<	10	<	10
2,4-Dimethylphenol	ug/L (ppb)	---	---	<	100	<	10	<	10	<	10
2,4-Dinitrophenol	ug/L (ppb)	---	---	<	10	<	100	<	100	<	100
2-Chlorophenol	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
2-Methylphenol	ug/L (ppb)	---	---	<	20	<	10	<	10	<	10
2-Nitrophenol	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
3&4-Methylphenol	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
4,6-Dinitro-2-Methylphenol	ug/L (ppb)	---	---	<	10	<	50	<	50	<	50
4-Chloro-3-Methylphenol	ug/L (ppb)	---	---	<	50	<	20	<	20	<	20
4-Nitrophenol	ug/L (ppb)			<	10	<	50	<	50	<	50
Benzoic Acid	ug/L (ppb)	---	---	<	50	<	10	<	10	<	10
Pentachlorophenol	ug/L (ppb)	1	0.5	<	20	<	50	<	50	<	50
Phenol	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10

TABLE 4

SUMMARY OF GZA's GROUNDWATER ANALYTICAL RESULTS FOR RIB AREA

Charbet Facility
Alton, Rhode Island

PARAMETERS	UNITS	RIDEM STANDARDS		GZ-5		GP-20		GP-21		GP-29	
		GA	PALs	2/24/2005		2/15/2005		2/15/2005		2/15/2005	
				Result	Limit	Result	Limit	Result	Limit	Result	Limit
BASE-NEUTRAL FRACTION											
1,2,4 Trichlorobenzene	ug/L (ppb)	70	35	<	10	<	10	<	10	<	10
1,2-Dichlorobenzene	ug/L (ppb)	600	300	<	10	<	10	<	10	<	10
1,3-Dichlorobenzene	ug/L (ppb)	600	300	<	10	<	10	<	10	<	10
1,4 Dichlorobenzene	ug/L (ppb)	75	37.5	<	10	<	10	<	10	<	10
2,4-Dinitrotoluene	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
2,6-Dinitrotoluene	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
2-Chloronaphthalene	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
2-Methylnaphthalene	ug/L (ppb)	---	---	<	10	<	2.0	<	2.0	<	2.0
2-Nitroaniline	ug/L (ppb)	---	---	<	10	<	50	<	50	<	50
3,3'-Dichlorobenzidine	ug/L (ppb)	---	---	<	2.0	<	20	<	20	<	20
3-Nitroaniline	ug/L (ppb)	---	---	<	10	<	50	<	50	<	50
4-Bromophenyl Phenyl Ether	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
4-Chloroaniline	ug/L (ppb)	---	---	<	10	<	20	<	20	<	20
4-Chlorophenyl Phenyl Ether	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
4-Nitroaniline	ug/L (ppb)	---	---	<	10	<	20	<	20	<	20
Acenaphthene	ug/L (ppb)	---	---	<	20	<	2.0	<	2.0	<	2.0
Acenaphthylene	ug/L (ppb)	---	---	<	10	<	2.0	<	2.0	<	2.0
Anthracene	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Benzo [a] Anthracene	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Benzo [a] Pyrene	ug/L (ppb)	0.2	0.1	<	10	<	2.0	<	2.0	<	2.0
Benzo [b] Fluoranthene	ug/L (ppb)	---	---	<		<	2.0	<	2.0	<	2.0
Benzo [g,h,i] Perylene	ug/L (ppb)	---	---	<	5.0	<	2.0	<	2.0	<	2.0
Benzo [k] Fluoranthene	ug/L (ppb)	---	---	<	5.0	<	2.0	<	2.0	<	2.0
Benzyl Alcohol	ug/L (ppb)	---	---	<	10	<	20	<	20	<	20
bis(2-Chloroethoxy)Methane	ug/L (ppb)	---	---	<	50	<	10	<	10	<	10
bis(2-Chloroethyl)Ether	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
bis(2-Chloroisopropyl)Ether	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
bis(2-Ethylhexyl)Phthalate	ug/L (ppb)	6	3	<	2.0	<	10	<	10	<	10
Butylbenzylphthalate	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
Carbazole	ug/L (ppb)	---	---	<	20	<	10	<	10	<	10
Chrysene	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Dibenzo [a,h] Anthracene	ug/L (ppb)	---	---	<	5.0	<	2.0	<	2.0	<	2.0
Dibenzofuran	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
Diethylphthalate	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
Dimethylphthalate	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
di-n-Butylphthalate	ug/L (ppb)	---	---	<	2.0	<	15	<	15	<	15
di-n-Octylphthalate	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
Fluoranthene	ug/L (ppb)	---	---	<	10	<	2.0	<	2.0	<	2.0
Fluorene	ug/L (ppb)	---	---	<	2.0	<	2.0	<	2.0	<	2.0
Hexachlorobenzene	ug/L (ppb)	1	0.5	<	2.0	<	10	<	10	<	10
Hexachlorobutadiene	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
Hexachlorocyclopentadiene	ug/L (ppb)	50	25	<	50	<	50	<	50	<	50
Hexachloroethane	ug/L (ppb)	---	---	<	20	<	10	<	10	<	10
Indeno [1,2,3-cd] Pyrene	ug/L (ppb)	---	---	<	5.0	<	2.0	<	2.0	<	2.0
Isophorone	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
Naphthalene	ug/L (ppb)	20	10	<	50	<	2.0	<	2.0	<	2.0
Nitrobenzene	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
n-Nitrosodimethylamine	ug/L (ppb)	---	---	<	10	<	10	<	10	<	10
n-Nitrosodi-n-Propylamine	ug/L (ppb)	---	---	<	2.0	<	10	<	10	<	10
n-Nitrosodiphenylamine	ug/L (ppb)	---	---	<	15	<	10	<	10	<	10
Phenanthrene	ug/L (ppb)	---	---	<	10	<	2.0	<	2.0	<	2.0
Pyrene	ug/L (ppb)	---	---	<	10	<	2.0	<	2.0	<	2.0
TOTAL PETROLEUM HYDROCARBONS											
Hydrocarbon Content	ug/L (ppb)	---	---	NT		NT		NT		3,100	250
VOLATILE PETROLEUM HYDROCARBONS											
C5-C8 Aliphatics	ug/L (ppb)	400	---	NT	10	NT		NT		46	10
C9-C12 Aliphatics	ug/L (ppb)	4,000	---	NT	10	NT		NT		30	10
C9-C10 Aromatics	ug/L (ppb)	200	---	NT	10	NT		NT		17	10
EXTRACTABLE PETROLEUM HYDROCARBONS											
C9-C18 Aliphatic Fraction	ug/L (ppb)	4,000	---	NT		NT		NT		150	100
C19-C36 Aliphatic Fraction	ug/L (ppb)	5,000	---	NT		NT		NT		<	100
C11-C22 Aromatic Fraction	ug/L (ppb)	200	---	NT		NT		NT		1,600	100
METALS											
Iron	ug/L (ppb)	---	---	NT		NT		NT		3,740	25
Manganese	ug/L (ppb)	---	---	NT		NT		NT		1,310	5.0
PRIORITY POLLUTANT METALS											
Silver	ug/L (ppb)	---	---	<	5.0	45	5.0	18	5.0	NT	
Arsenic	ug/L (ppb)	10	5	<	10	<	10	<	10	NT	
Beryllium	ug/L (ppb)	4	2	<	5.0	<	5.0	<	5.0	NT	
Cadmium	ug/L (ppb)	5	2.5	<	5.0	<	5.0	<	5.0	NT	
Chromium	ug/L (ppb)	100	50	12	5.0	47	5.0	43	5.0	NT	
Copper	ug/L (ppb)	1,300	650	<	15	<	15	<	15	NT	
Mercury	ug/L (ppb)	2	1	<	0.5	<	0.5	<	0.5	NT	
Nickel	ug/L (ppb)	100	50	<	10	<	10	<	10	NT	
Lead	ug/L (ppb)	15	7.5	<	10	<	10	<	10	NT	
Antimony	ug/L (ppb)	6	3	<	25	<	25	<	25	NT	
Selenium	ug/L (ppb)	50	25	<	25	<	25	<	25	NT	
Thallium	ug/L (ppb)	2	1	<	25	<	25	<	25	NT	
Zinc	ug/L (ppb)	---	---	11	10	<	10	<	10	NT	
WATER QUALITY PARAMETERS											
Ammonia	ug/L (ppb)	---	---	10		17,000	100	11,000	100	NT	
Nitrate & Nitrite	ug/L (ppb)	1,000	500	<		30	10	20	10	NT	
Total Organic Carbon	ug/L (ppb)	---	---	NT		NT		NT		NT	
Sulfate by IC	ug/L (ppb)	---	---	NT		NT		NT		NT	
Total Coliform	MPN/100ml	ND	ND	NT		NT		NT		NT	
Fecal Coliform	MPN/100ml	ND	ND	NT		NT		NT		NT	
Heterotrophic Plate Count	cfu/ml	---	---	NT		NT		NT		NT	
Surfactants	mg/L (ppm)	---	---	NT		NT		NT		NT	
Ortho-Phosphate	mg/L (ppm)	---	---	NT		NT		NT		NT	
Sulfide	mg/L (ppm)	---	---	NT		NT		NT		NT	
Nitrate	mg/L (ppm)	10	5	NT		NT		NT		NT	
Chloride	mg/L (ppm)	---	---	NT		NT		NT		NT	
Sulfate	mg/L (ppm)	---	---	NT		NT		NT		NT	

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TABLE 5

SUMMARY OF GZA's SOIL TESTING RESULT FORM THE PROPOSED RIB AREA

Cherbert Facility
Alton, Rhode Island

PARAMETER	UNITS	RIDEM SOIL STANDARDS			GZ-5/S-8 10-12 ft.		GP-20/S-3 8-9.5ft		GP-21/S-3 8-9 ft.		GP 21/S 4 13-15 ft. (BGWT)		GP-20/S-8 14-16 ft.		GP-29/S-8 19-20 ft (BGWT)	
		GA LEACH	RDEC	I/CDEC	2/3/2005		1/11/2005		1/11/2005		1/11/2005		1/11/2006		1/11/2005	
					Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit
VOLATILE ORGANICS																
Dichlorodifluoromethane	mg/kg (ppm)	---	---	---	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
Chloromethane	mg/kg (ppm)	---	---	---	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
Vinyl Chloride	mg/kg (ppm)	0.3	0.02	3	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Bromomethane	mg/kg (ppm)	---	0.8	2,900	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
Chloroethane	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Trichlorofluoromethane	mg/kg (ppm)	---	---	---	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
Diethylether	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Acetone	mg/kg (ppm)	---	7,800	10,000	<	0.7	<	0.800	<	0.750	<	0.700	<	0.750	<	0.750
1,1-Dichloroethene	mg/kg (ppm)	0.7	0.2	9.5	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Dichloromethane	mg/kg (ppm)	---	45	760	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Methyl-Tert-Butyl-Ether	mg/kg (ppm)	0.9	390	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
trans-1,2-Dichloroethene	mg/kg (ppm)	3.3	1,100	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,1-Dichloroethane	mg/kg (ppm)	---	920	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
2-Butanone (MEK)	mg/kg (ppm)	---	10,000	10,000	<	0.7	<	0.800	<	0.750	<	0.700	<	0.750	<	0.750
2,2-Dichloropropane	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
cis-1,2-Dichloroethene	mg/kg (ppm)	1.7	630	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Chloroform	mg/kg (ppm)	---	1.2	940	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Bromochloromethane	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Tetrahydrofuran	mg/kg (ppm)	---	---	---	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
1,1,1-Trichloroethane	mg/kg (ppm)	11	540	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,1-Dichloropropene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Carbon Tetrachloride	mg/kg (ppm)	0.4	1.5	44	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,2-Dichloroethane	mg/kg (ppm)	0.1	0.9	63	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Benzene	mg/kg (ppm)	0.2	2.5	200	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Trichloroethene	mg/kg (ppm)	0.2	13	520	<	0.07	<	0.080	<	0.075	<	0.075	<	0.075	<	0.075
1,2-Dichloropropane	mg/kg (ppm)	0.1	1.9	84	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Bromodichloromethane	mg/kg (ppm)	---	10	92	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Dibromomethane	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
4-Methyl-2-Pentanone	mg/kg (ppm)	---	---	---	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
cis-1,3-Dichloropropene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Toluene	mg/kg (ppm)	32	190	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
trans-1,3-Dichloropropene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,1,2-Trichloroethane	mg/kg (ppm)	0.1	3.6	100	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
2-Hexanone (MIBK)	mg/kg (ppm)	---	1,200	10,000	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
1,3-Dichloropropane	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Tetrachloroethene	mg/kg (ppm)	0.1	12	110	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Dibromochloromethane	mg/kg (ppm)	---	7.6	68	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,2-Dibromoethane (EDB)	mg/kg (ppm)	0.0005	0.01	0.07	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
Chlorobenzene	mg/kg (ppm)	3.2	210	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	---	2.2	220	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Ethylbenzene	mg/kg (ppm)	27	71	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
m&p-Xylene	mg/kg (ppm)	540	110	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
o-Xylene	mg/kg (ppm)	540	110	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Styrene	mg/kg (ppm)	2.9	13	190	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Bromoform	mg/kg (ppm)	---	81	720	<	0.14	<	0.160	<	0.150	<	0.140	<	0.150	<	0.150
Isopropylbenzene	mg/kg (ppm)	---	27	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	---	1.3	29	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,2,3-Trichloropropane	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Bromobenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
n-Propylbenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
2-Chlorotoluene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,3,5-Trimethylbenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
4-Chlorotoluene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
tert-Butylbenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,2,4-Trimethylbenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
sec-Butylbenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
p-Isopropyltoluene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,3-Dichlorobenzene	mg/kg (ppm)	41	430	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,4-Dichlorobenzene	mg/kg (ppm)	41	27	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
n-Butylbenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,2-Dichlorobenzene	mg/kg (ppm)	41	510	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,2-Dibromo-3-Chloropropane	mg/kg (ppm)	---	0.5	4.1	<	0.35	<	0.400	<	0.380	<	0.350	<	0.380	<	0.380
1,2,4-Trichlorobenzene	mg/kg (ppm)	140	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Hexachlorobutadiene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
Naphthalene	mg/kg (ppm)	0.8	54	10,000	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
1,2,3-Trichlorobenzene	mg/kg (ppm)	---	---	---	<	0.07	<	0.080	<	0.075	<	0.070	<	0.075	<	0.075
SEMI-VOLATILE ORGANICS																
Phenol	mg/kg (ppm)	---	6,000	10,000	NT		NT		NT		NT		NT		NT	
2-Chlorophenol	mg/kg (ppm)	---	50	10,000	NT		NT		NT		NT		NT		NT	
2-Methylphenol	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
3&4-Methylphenol	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
2-Nitrophenol	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
2,4-Dimethylphenol	mg/kg (ppm)	---	1,400	10,000	NT		NT		NT		NT		NT		NT	
Benzoic Acid	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
2,4-Dichlorophenol	mg/kg (ppm)	---	30	6,100	NT		NT		NT		NT		NT		NT	
4-Chloro-3-Methylphenol	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
2,4,6-Trichlorophenol	mg/kg (ppm)	---	58	520	NT		NT		NT		NT		NT		NT	
2,4,5-Trichlorophenol	mg/kg (ppm)	---	330	10,000	NT		NT		NT		NT		NT		NT	
2,4-Dinitrophenol	mg/kg (ppm)	---	160	4,100	NT		NT		NT		NT		NT		NT	
4-Nitrophenol	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
4,6-Dinitro-2-Methylphenol	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Pentachlorophenol	mg/kg (ppm)	7.1	5.3	48	NT		NT		NT		NT		NT		NT	
n-Nitrosodimethylamine	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
bis(2-Chloroethyl)Ether	mg/kg (ppm)	---	0.6	5.2	NT		NT		NT		NT		NT		NT	
1,3-Dichlorobenzene	mg/kg (ppm)	41	430	10,000	NT		NT		NT		NT		NT		NT	
1,4-Dichlorobenzene	mg/kg (ppm)	41	27	240	NT		NT		NT		NT		NT		NT	
Benzyl Alcohol	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	

TABLE 5

SUMMARY OF GZA's SOIL TESTING RESULT FORM THE PROPOSED RIB AREA

Charbert Facility
Alton, Rhode Island

PARAMETER	UNITS	RIDEM SOIL STANDARDS			GZ-5/S-6 10-12 ft		GP-20/S-3 8-9.5 ft		GP-21/S-3 8-9 ft		GP-21/S-4 13-15 ft (BGWT)		GP 29/S-5 14-15 ft		GP 29/S-6 19-20 ft (BGWT)	
		GA LEACH	RDEC	I/CDEC	2/3/2005		1/11/2005		1/11/2005		1/11/2005		1/11/2005		1/11/2005	
					Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit	Result	Limit
1,2-Dichlorobenzene	mg/kg (ppm)	41	510	10,000	NT		NT		NT		NT		NT		NT	
bis(2-Chloroisopropyl)Ether	mg/kg (ppm)	---	9.1	82	NT		NT		NT		NT		NT		NT	
n-Nitrosodi-n-Propylamine	mg/kg (ppm)		---	---	NT		NT		NT		NT		NT		NT	
Hexachloroethane	mg/kg (ppm)	---	46	410	NT		NT		NT		NT		NT		NT	
Nitrobenzene	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Isophorone	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
bis(2-Chloroethoxy)Methane	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
1,2,4-Trichlorobenzene	mg/kg (ppm)	140	96	10,000	NT		NT		NT		NT		NT		NT	
Naphthalene	mg/kg (ppm)	0.8	54	10,000	NT		NT		NT		NT		NT		NT	
4-Chloroaniline	mg/kg (ppm)	---	310	8,200	NT		NT		NT		NT		NT		NT	
Hexachlorobutadiene	mg/kg (ppm)		8.2	73	NT		NT		NT		NT		NT		NT	
2-Methylnaphthalene	mg/kg (ppm)	---	123	10,000	NT		NT		NT		NT		NT		NT	
Hexachlorocyclopentadiene	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
2-Chloronaphthalene	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
2-Nitroaniline	mg/kg (ppm)	---	---		NT		NT		NT		NT		NT		NT	
Dimethylphthalate	mg/kg (ppm)		1,900	10,000	NT		NT		NT		NT		NT		NT	
Acenaphthylene	mg/kg (ppm)	---	23	10,000	NT		NT		NT		NT		NT		NT	
2,6-Dinitrotoluene	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
3-Nitroaniline	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Acenaphthene	mg/kg (ppm)	---	43	10,000	NT		NT		NT		NT		NT		NT	
Dibenzofuran	mg/kg (ppm)		---	---	NT		NT		NT		NT		NT		NT	
2,4-Dinitrotoluene	mg/kg (ppm)	---	0.9	8.4	NT		NT		NT		NT		NT		NT	
Diethylphthalate	mg/kg (ppm)	---	340	10,000	NT		NT		NT		NT		NT		NT	
Fluorene	mg/kg (ppm)	---	28	10,000	NT		NT		NT		NT		NT		NT	
4-Chlorophenyl Phenyl Ether	mg/kg (ppm)	---	---		NT		NT		NT		NT		NT		NT	
4-Nitroaniline	mg/kg (ppm)		---	---	NT		NT		NT		NT		NT		NT	
n-Nitrosodiphenylamine	mg/kg (ppm)	---		---	NT		NT		NT		NT		NT		NT	
4-Bromophenyl Phenyl Ether	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Hexachlorobenzene	mg/kg (ppm)		0.4	3.6	NT		NT		NT		NT		NT		NT	
Phenanthrene	mg/kg (ppm)	---	40	10,000	NT		NT		NT		NT		NT		NT	
Anthracene	mg/kg (ppm)		35	10,000	NT		NT		NT		NT		NT		NT	
Carbazole	mg/kg (ppm)	---		---	NT		NT		NT		NT		NT		NT	
di-n-Butylphthalate	mg/kg (ppm)	---	---		NT		NT		NT		NT		NT		NT	
Fluoranthene	mg/kg (ppm)		20	10,000	NT		NT		NT		NT		NT		NT	
Pyrene	mg/kg (ppm)	---	13	10,000	NT		NT		NT		NT		NT		NT	
Butylbenzylphthalate	mg/kg (ppm)		---	---	NT		NT		NT		NT		NT		NT	
Benzo [a] Anthracene	mg/kg (ppm)	---	0.9	7.8	NT		NT		NT		NT		NT		NT	
3,3'-Dichlorobenzidine	mg/kg (ppm)	---	1.4	13	NT		NT		NT		NT		NT		NT	
Chrysene	mg/kg (ppm)	---	0.4	780	NT		NT		NT		NT		NT		NT	
bis(2-Ethylhexyl)Phthalate	mg/kg (ppm)	120	46	410	NT		NT		NT		NT		NT		NT	
di-n-Octylphthalate	mg/kg (ppm)		---	---	NT		NT		NT		NT		NT		NT	
Benzo [b] Fluoranthene	mg/kg (ppm)	---	0.9	7.8	NT		NT		NT		NT		NT		NT	
Benzo [k] Fluoranthene	mg/kg (ppm)	---	0.9	78	NT		NT		NT		NT		NT		NT	
Benzo [a] Pyrene	mg/kg (ppm)	240	0.4	0.8	NT		NT		NT		NT		NT		NT	
Indeno [1,2,3-cd] Pyrene	mg/kg (ppm)	---	0.9	7.8	NT		NT		NT		NT		NT		NT	
Dibenzo [a,h] Anthracene	mg/kg (ppm)		0.4	0.8	NT		NT		NT		NT		NT		NT	
Benzo [g,h,i] Perylene	mg/kg (ppm)	---	0.8	10,000	NT		NT		NT		NT		NT		NT	
TARGET PAHs																
Naphthalene (Diesel PAH)	mg/kg (ppm)	0.8	54	10,000	NT		NT		<	0.3	NT		NT		NT	
2 Methylnaphthalene	mg/kg (ppm)	---	123	10,000	NT		NT		<	0.3	NT		NT		NT	
Acenaphthylene (Diesel PAH)	mg/kg (ppm)		23	10,000	NT		NT		<	0.3	NT		NT		NT	
Acenaphthene (Diesel PAH)	mg/kg (ppm)	---	43	10,000	NT		NT		<	0.3	NT		NT		NT	
Fluorene	mg/kg (ppm)	---	28	10,000	NT		NT		<	0.3	NT		NT		NT	
Phenanthrene (Diesel PAH)	mg/kg (ppm)		40	10,000	NT		NT		<	0.3	NT		NT		NT	
Anthracene	mg/kg (ppm)	---	35	10,000	NT		NT		<	0.3	NT		NT		NT	
Fluoranthene	mg/kg (ppm)		20	10,000	NT		NT		<	0.3	NT		NT		NT	
Pyrene	mg/kg (ppm)	---	13	10,000	NT		NT		<	0.3	NT		NT		NT	
Benzo [a] Anthracene	mg/kg (ppm)	---	0.9	7.8	NT		NT		<	0.3	NT		NT		NT	
Chrysene	mg/kg (ppm)		0.4	780	NT		NT		<	0.3	NT		NT		NT	
Benzo [b] Fluoranthene	mg/kg (ppm)	---	0.9	7.8	NT		NT		<	0.3	NT		NT		NT	
Benzo [k] Fluoranthene	mg/kg (ppm)	---	0.9	78	NT		NT		<	0.3	NT		NT		NT	
Benzo [a] Pyrene	mg/kg (ppm)	240	0.4	0.8	NT		NT		<	0.3	NT		NT		NT	
Indeno [1,2,3-cd] Pyrene	mg/kg (ppm)	---	0.9	7.8	NT		NT		<	0.3	NT		NT		NT	
Dibenzo [a,h] Anthracene	mg/kg (ppm)		0.4	0.8	NT		NT		<	0.3	NT		NT		NT	
Benzo [g,h,i] Perylene	mg/kg (ppm)	---	0.8	10,000	NT		NT		<	0.3	NT		NT		NT	
SVOC TENTATIVELY IDENTIFIED COMPOUNDS																
Tridecane	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Tetradecane	mg/kg (ppm)	---		---	NT		NT		NT		NT		NT		NT	
Hexadecane	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Heptadecane	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
1-methyl 2-pyrrolidinone	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Unknown compound	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
dimethyl naphthalene isomer	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
C15 alkane isomer	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
C16 alkane isomer	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
C18 alkane isomer	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
C14 alkyl PAH	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
C4 alkyl benzene isomer	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
POLYCHLORINATED BIPHENYLS																
Aroclor 1268	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	
Aroclor 1262	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	
Aroclor 1260	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	
Aroclor 1254	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	
Aroclor 1248	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	
Aroclor 1242/1016	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	
Aroclor 1232	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	
Aroclor 1221	mg/kg (ppm)	10	10	10	NT		NT		NT		NT		NT		NT	

TABLE 5

SUMMARY OF GZA's SOIL TESTING RESULT FORM THE PROPOSED RIB AREA

Charbert Facility
Alton, Rhode Island

PARAMETER	UNITS	RIDEM SOIL STANDARDS GA LEACH	RDEC	IMCDEC	GZ-5/S-6 10-12 ft. 2/3/2005 Result	Limit	GP-20/S-3 8-9.5ft 1/11/2005 Result	Limit	GP-21/S-3 8-9 ft. 1/11/2005 Result	Limit	GP-21/S-4 13-15 ft. (BGWT) 1/11/2006 Result	Limit	GP-29/S-5 14-15 ft. 1/11/2005 Result	Limit	GP-29/S-8 19-20 ft. (BGWT) 1/11/2005 Result	Limit
ORGANOCHLORINE PESTICIDES																
alpha-BHC	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
gamma-BHC (Lindane)	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
beta-BHC	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Heptachlor	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
delta-BHC	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Aldrin	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Heptachlor Epoxide	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Endosulfan I	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
4,4'-DDE	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Dieldrin	mg/kg (ppm)	---	0.04	0.4	NT		NT		NT		NT		NT		NT	
Endrin	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
4,4'-DDD	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Endosulfan II	mg/kg (ppm)		---	---	NT		NT		NT		NT		NT		NT	
4,4'-DDT	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Endrin Aldehyde	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Endosulfan Sulfate	mg/kg (ppm)	---		---	NT		NT		NT		NT		NT		NT	
Methoxychlor	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Endrin Ketone	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
Toxaphene	mg/kg (ppm)	---	---	---	NT		NT		NT		NT		NT		NT	
gamma-Chlordane	mg/kg (ppm)	1.4	0.5	4.4	NT		NT		NT		NT		NT		NT	
alpha-Chlordane	mg/kg (ppm)	1.4	0.5	4.4	NT		NT		NT		NT		NT		NT	
VOLATILE PETROLEUM HYDROCARBONS Massachusetts S-1 & GW-1 Standards																
C5-C8 Aliphatics	mg/kg (ppm)	100	100	100	NT		NT		<	0.5	NT		NT		NT	
C9-C12 Aliphatics	mg/kg (ppm)	1,000	1,000	1,000	NT		NT		<	0.5	NT		NT		NT	
C9-C10 Aromatics	mg/kg (ppm)	100	100	100	NT		NT		<	0.5	NT		NT		NT	
EXTRACTABLE PETROLEUM HYDROCARBONS Massachusetts S-1 & GW-1 Standards																
Unadjusted C11-C22 Aromatic	mg/kg (ppm)	---	---	---	NT		NT		48*		NT		NT		NT	
C9-C18 Aliphatic Fraction	mg/kg (ppm)	1,000	1,000	1,000	NT		NT		<	5.0	NT		NT		NT	
C19-C36 Aliphatic Fraction	mg/kg (ppm)	2,500	2,500	2,500	NT		NT		6.5	5.0	NT		NT		NT	
C11-C22 Aromatic Fraction	mg/kg (ppm)	200	200	200	NT		NT		48*		NT		NT		NT	
TOTAL PETROLEUM HYDROCARBON																
Hydrocarbon Content	mg/kg (ppm)	500-1000	500-1000	2,500	NT		31*	20	88	10	NT		<	20	NT	
PETROLEUM HYDROCARBON FINGERPRINT																
Fuel Oil					NT						NT		NT		NT	
Uncharacterizable Material							50%		80%							
Organo-siloxanes (see definition)							50%		20%							
TOTAL METALS																
Antimony	mg/kg (ppm)	---	10	820	NT		<	2.64	<	2.38	NT		<	2.46	NT	
Barium	mg/kg (ppm)	---	5,500	10,000	NT		18.2	0.529	4.19	0.475	NT		6.03	0.492	NT	
Beryllium	mg/kg (ppm)	---	0.4	1.3	NT		<	0.529	<	0.475	NT		<	0.492	NT	
Cadmium	mg/kg (ppm)	---	39	1,000	NT		<	0.529	<	0.475	NT		<	0.492	NT	
Chromium	mg/kg (ppm)	---	390	10,000	NT		8.47	0.529	2.45	0.475	NT		0.531	0.492	NT	
Mercury	mg/kg (ppm)	---	23	610	NT		<	0.0317	<	0.0246	NT		<	0.0293	NT	
Nickel	mg/kg (ppm)	---	1,000	10,000	NT		4.37	1.06	<	0.951	NT		<	0.983	NT	
Lead	mg/kg (ppm)	---	150	500	NT		5.34	1.06	<	0.951	NT		<	0.983	NT	
Selenium	mg/kg (ppm)	---	390	10,000	NT		<	2.64	<	2.38	NT		<	2.46	NT	
Thallium	mg/kg (ppm)	---	5.5	140	NT		<	2.64	<	2.38	NT		<	2.46	NT	
SPLP - METALS																
Antimony	mg/L (ppm)	0.05	---	---	NT		<	0.020	<	0.020	NT		<	0.020	NT	
Barium	mg/L (ppm)	23	---	---	NT		0.0454	0.0050	0.0136	0.0050	NT		0.0391	0.0050	NT	
Beryllium	mg/L (ppm)	0.03	---	---	NT		<	0.0050	<	0.0050	NT		<	0.0050	NT	
Cadmium	mg/L (ppm)	0.03	---	---	NT		<	0.0050	<	0.0050	NT		<	0.0050	NT	
Chromium	mg/L (ppm)	1.1	---	---	NT		<	0.0050	<	0.0050	NT		<	0.0050	NT	
Mercury	mg/L (ppm)	0.02		---	NT		<	0.0005	<	0.0005	NT		<	0.0005	NT	
Nickel	mg/L (ppm)	1	---	---	NT		<	0.010	<	0.010	NT		<	0.010	NT	
Lead	mg/L (ppm)	0.04	---	---	NT		0.013	0.010	<	0.010	NT		<	0.010	NT	
Selenium	mg/L (ppm)	0.6	---	---	NT		<	0.025	<	0.025	NT		<	0.025	NT	
Thallium	mg/L (ppm)	0.005	---		NT		<	0.015	<	0.015	NT		<	0.015	NT	
PERCENT SOLID	%						81.2		35.5		30.5		94.9		86.6	