DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Agency Realty (Carroll Products)
Facility Address: 477 Church Street, Richmond, RI
Facility EPA ID #: **RID002042216**

1. *Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?*

   _X_ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

This Environmental Indicator Evaluation updates an earlier EI Evaluation of the Carroll Products site completed by Robert Brackett, EPA, dated September 26, 1996. References used for this determination include the reports listed below:

Phase II Interim data Report (April 1994); Data Comparison Report prepared by CDM Federal (April 28, 1994); RFI Sampling Oversight Report prepared by ATK (February 27, 1995); Phase II Waste Stabilization and Restoration Report (August 1996); Phase III Waste Stabilization and Restoration Project Final Report (January 1998); Subslab Soil Evaluation Report (August 1996); Progress Report No. 96-1 (December 20, 1996); Revised Phase II Stabilization Sampling Oversight Report, by ATK (February 12, 1997); Slab Demolition Oversight Report, by ATK (March 3, 1997); Progress Report No. 97-1 (March 12, 1997); Progress Report No. 97-2 (May 1997); Phase II RFI Split Sampling Oversight Report, by TechLaw Inc. (October 7, 1997); Progress Report No. 1, Soil Vapor Extraction Plan (July 2000); Environmental Indicator Code Determination for Carroll Products, prepared by Bob Brackett, (September 26, 1996); Environmental Indicator Status Report, prepared by GZA (July 13, 1999); Response to Comments on Environmental Indicator Status Report, prepared by GZA (September 30, 1999); Fourth Annual Monitoring of Wetland Restoration Area (January 2000).

These references can be found in the project file located in the Records Center.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

FACILITY BACKGROUND INFORMATION

The site is located in a rural area in southern RI on Route 91. The Pawcatuck River and the Boston-New York Amtrak railroad tracks border the site to the southeast and southwest, and the site is located within the 100 year flood plain of the Pawcatuck. United Nuclear Corp. owns undeveloped property between the RR tracks and the river. Tuckahoe Turf is located across Route 91 to the north. Widely spaced homes are located to the northeast and west of the site. There is no municipal water supply or sewer service in the area.

The Pawcatuck Basin Aquifer System is a designated sole source aquifer, and the groundwater classification is GA/GAA. The site is underlain by a bedrock valley filled with glacial outwash deposits which are highly transmissive. Surficial geology consists of at least 314 feet of sand and gravel interbedded with fine sand, silt and clay. Glacial till reportedly mantles bedrock and is less than 20 feet thick. Bedrock is mapped as the Hope Valley Gneiss. Ground water is located from 6 to 13 feet below grade and flows toward the east/southeast toward the river.

An approximately five acre portion of the site was used for manufacturing operations from before 1945 until the 1990's. Until recently, this area included several buildings and two unlined lagoons which received waste from manufacturing operations. The two lagoons totaled approximately 2 acres in area. In 1996, all buildings on the site were demolished.

SUMMARY OF SITE INVESTIGATIONS

In 1986, EPA, Carroll Products (ARM), and former owner Sequa Corp. signed a RCRA 3013 consent order to investigate the site. Sequa's consultant GZA performed initial site investigation activities in 1987. In 1989, sampling of lagoon sediments detected metals concentrations as high as 40,900 ppm chromium, 41,400 ppm lead, and 179,000 ppm zinc. Concentrations of various semivolatile organic compounds ranged up to 570 ppm.

In 1992, GZA began a second phase of investigation (Phase II-A of the RFI). GZA performed electromagnetic and ground penetrating radar investigations to characterize subsurface conditions prior to beginning subsurface investigations at the site. During the fall of 1993, GZA installed and sampled 17 monitoring wells, numerous test pits and piezometers, and sampled of ground water, surface water, sediments, soils, and lagoon sludge. One deep boring was performed downgradient from the lagoons to screen overburden sediments, determine depth to bedrock, and to assess groundwater quality in bedrock by installing a monitoring well. The boring was advanced to 314 feet without encountering bedrock. The drillers encountered problems and the boring was backfilled without the installation of a monitoring well. PID screening of split spoon soil samples did not detect any deep zones of contamination.

In October and November, 1993, EPA's contractor observed GZA's field activities, and received and analyzed split samples from borings, surface soil, sediment, lagoon soils, monitoring wells, and surface water. Results of the split sampling are detailed in the April 28, 1994 Data Comparison Report prepared by CDM Federal. Overall, the analytical data from the split samples received by CDM compared closely to the GZA data, except for inorganic results from GZ93-8 which were higher in the CDM split samples than the GZA samples.

As part of the Phase II-A RFI, GZA re-sampled 17 wells a second time in late 1994 using low flow procedures. Groundwater samples were analyzed for metals and sulfides. EPA's contractor was present to observe sampling activities and receive groundwater split samples which were analyzed for total metals and sulfides. The low flow sampling resulted in significantly lower metals concentrations than the data obtained in 1993 using bailers. This information is detailed in the February 27, 1995 RFI Sampling Oversight Report prepared by A.T.Kearney.

A third phase of investigation (Phase II-B of the RFI) was conducted in 1996/1997. Investigation activities included a soil gas survey, installation of several monitoring wells and microwells, and collection and analysis of groundwater samples, surface and subsurface soil samples, and marsh and wetland sediment samples. One microwell (DP-3) was advanced to a depth of 152 feet below grade, with groundwater samples collected at 10 to 20 foot intervals down to 130 feet. On November 21, 1996, EPA's contractor TechLaw observed sampling activities and received splits of 6 groundwater samples collected by GZA. The samples were analyzed for VOCs and metals. A comparison of the TechLaw and GZA data show that the results compared very closely. This information is contained in the October 7, 1997 Phase II RFI Split Sampling Oversight Report prepared by TechLaw Inc.

A fourth phase of investigation was conducted in May 1998. A total of 19 test pits were completed in the western, undeveloped portion of the property. Soil samples collected from the test pits were screened for VOCs in the field, and a limited number of samples were analyzed for metals, SVOCs, TPH, and VOCs in the laboratory. In general, contamination was not detected in the area, although one test pit near the western facility yard exhibited signs of decaying organic matter.

SUMMARY OF STABILIZATION ACTIVITIES

In 1994, EPA and Sequa signed a Memorandum of Agreement in which Sequa agreed to conduct stabilization actions to remediate the lagoons and reconstruct the wetlands as a stabilization measure. Since that time, Sequa has performed the following stabilization activities.

Underground Storage Tank (UST) removal. In May 1994, three USTs were removed from the property. Two 12,000 gallon No. 4/6 heating oil tanks were located near the southwest boundary of the property, and one 10,000 gallon heating oil tank was located near the middle of the facility yard. Petroleum contaminated soils and groundwater were observed at both locations. As a result, RIDEM Division of Site Remediation issued Sequa and ARM a Notice of Violation and Order on September 27, 1994 to investigate and cleanup the contamination. Contaminated soils in the vicinity of the 10,000 gallon UST were removed from the site during the Phase II-Stabilization efforts outlined below. Floating LNAPL (thick, viscous, weathered #4 or #6 fuel oil) was detected in the vicinity of the two 12,000 gallon tanks.

Phase I- Stabilization. In the fall of 1994, GZA excavated and transported off-site 4,200 cubic yards of sludge from the lagoons. During the remedial activities, it was determined that buried sludge extended into the facility yard. The buried sludge remained in place until the Phase II - Stabilization effort outlined below. EPA's contractor A.T. Kearney provided oversight of the stabilization activities for a total of ten days in September and October, 1994.

Phase II- Stabilization. During the fall of 1995, GZA excavated and removed 7,255 cubic yards of sludge and soil from an overflow channel, the two former lagoons, and the eastern facility yard. In addition, 8 drums of PCB contaminated soil were excavated from an area near building 7 and removed from the site. After confirmatory sampling was completed, the former lagoons and overflow channel were restored as wetlands and the eastern facility yard was restored as a

grassy-upland area. Since 1996, the restored wetlands have been monitored annually to document conditions. To date, Sequa has submitted four annual reports (for years 1996 through 1999). The monitoring reports show that the wetland restoration area is developing adequately.

EPA's contractor A.T. Kearney conducted oversight of the Phase II-Stabilization sampling activities on six days in October and December, 1995. Oversight activities included observing and documenting soil sampling activities, and collecting 22 split soil samples for total lead and/or total metals. The Revised Phase II Stabilization Sampling Oversight Report, prepared by A.T. Kearney, dated February 12, 1997, details the findings. In summary, the procedures proposed in the approved stabilization plan were generally followed by GZA. Comparison of the split sampling data showed generally good agreement, and ATK concluded that GZA's data were reliable.

Building demolition. During the spring/summer of 1996, all remaining on-site buildings were demolished, the concrete slab foundations were excavated and stockpiled on site, and subslab soils inspected and sampled. On June 25, and July 1 and 2, 1996, EPA's contractor A.T.Kearney conducted oversight activities of the concrete building foundation and floor slab demolition and removal activities. ATK documented the activities, and a report,(Slab Demolition Oversight Report, dated March 3, 1997) with photographs was submitted to EPA.

Phase III-Stabilization. During the fall of 1997, GZA excavated and removed contaminated media from several areas on-site, including 6 areas under the former building slabs, two elevator shafts, a buried sludge area in the northwestern portion of the site, and the "bottle dump" area near Route 91. Approximately 2,500 tons of contaminated soil and sludge was removed from the site. In addition, approximately 6,600 tons of concrete from the foundations of the former buildings were sampled, crushed, placed as fill, and compacted in the former grassy area in the northwest portion of the site. Confirmatory sampling was performed at each excavation location to document remaining conditions. The excavated areas were re-graded, seeded, and a fence was replaced around the northern and western boundaries of the site.

Free Product Recovery. In the fall of 1998, GZA installed four free product recovery wells in the area of the two former 12,000 gallon #4/6 heating oil USTs near the site's southern property boundary. Each recovery well was outfitted with a belt skimmer and drum in a heated shed. The free product recovery system replaced the manual bi-weekly free product removal (using a bailer) from wells in the area. Since 1994, approximately 250 gallons of product have been recovered.

SVE System. Based on the results of the soil gas survey conducted in 1996, Sequa proposed the installation of a Soil Vapor Extraction (SVE) system to cleanup VOC source areas at two locations. Area 1 is located west of former building 4; Area 2 is located under the former slab of building 4. During the fall of 1999, GZA installed the SVE system, which consists of four vent wells (three in Area 1, and one in Area 2) piped to a treatment shed outfitted with a 3 horsepower blower and two carbon absorption vessels in series. GZA also installed four shallow groundwater monitoring wells to augment six existing wells used to evaluate baseline conditions and cleanup progress. The SVE system commenced operation on November 15, 1999 and

currently continues to operate. To date, one baseline (collected prior to system startup) and three quarterly rounds of groundwater samples from the 10 monitoring wells have been analyzed for VOCs. Results indicate a significant reduction of VOCs in groundwater in the western source area, and no discernable trends in the eastern source area.

UST Soil Remediation efforts. During the summer of 2000, GZA conducted a pilot test to evaluate the effectiveness of a new on-site treatment technology to reduce TPH concentrations in the petroleum contaminated soils in the vicinity of the two former 12,000 gallon #4/6 heating oil USTs. Approximately 1,400 tons of petroleum contaminated soils were stockpiled and treated. To date, results of the pilot test have been inconclusive. If the process is unable to lower TPH values in soils to below 1,000 ppm TPH, the soil will be transported to a licensed facility for disposal.

CURRENT SITE CONDITIONS

Soils. The majority of known contaminant source areas at this site have been remediated. Contaminated soil and sludge in the former lagoons have been excavated and removed, and approximately 2,300 cubic yards of clean fill was brought to the site as part of the wetlands reconstruction. Sludge and contaminated soils have been removed from the eastern and western facility yards and from beneath the former building slabs. Although a small percentage of confirmatory samples exhibited elevated concentrations of VOCs, zinc, and TPH, most samples were below cleanup standards. The eastern facility yard was re-graded with approximately 5,600 cubic yards of clean fill. The dilapidated buildings on-site have been demolished, and the concrete slabs have been crushed and buried on-site as fill. An SVE system has been installed to treat VOC contaminated soils at two locations, and groundwater monitoring wells downgradient exhibit decreasing VOC concentrations.

One of four wetland soil samples collected in 1993 from a forested area in the Pawcatuck River backwater area, approximately 300 feet southeast of the lagoons, contained an elevated arsenic concentration (101 ppm). Sample WS-6 was collected from the bank of the river. In 1996, GZA collected 3 additional wetland soil samples from the same area to better define the extent of the contamination. Two of the samples contained less than 20 ppm arsenic. One sample contained 76 ppm arsenic. Elevated concentrations of iron were also detected. Lead levels in these samples were at background levels, and no other significant contamination was detected in this area. It is possible that the elevated concentrations of arsenic are not site related, since arsenic is not a significant contaminant of concern at the site. However, the detection of elevated iron concentrations in both the river bank and the former lagoons suggests a similar source. Additional investigations in this area may be necessary to resolve this issue.

A few confirmatory samples collected after the Phase II-stabilization exhibited elevated concentrations of di-n-butylphthalate; the highest concentration (130 ppm) was detected in sample CS-171 from the eastern facility yard. This area was covered with several feet of clean fill.

The only major source of soil contamination remaining at the site is near the southwestern property boundary where the two former 12,000 gallon USTs were removed in 1994. Although LNAPL recovery systems have been installed and 1,400 tons of soil were removed during a pilot test to treat the petroleum contaminated soils, significant quantities of LNAPL and contaminated soil remain. This area is located adjacent to the Amtrak train tracks. Removal of additional soils could destabilize the tracks. It is likely that contaminated soils extend onto the Amtrak property, although the LNAPL is highly viscous and does not appear to be migrating. Downgradient wells south of the tracks do not exhibit petroleum contamination.

Groundwater. Approximately 30 monitoring wells currently exist at the site, and numerous microwells have been performed to augment monitoring wells. Site wide groundwater sampling rounds were carried out in 1993, 1994 (metals and sulfides only), and 1996. In addition, 10 monitoring wells have been sampled on four occasions in 1999 and 2000 to monitor the impact of the SVE system on groundwater quality. Chlorinated hydrocarbons, BTEX, and metals have been detected at concentrations above MCLs in shallow site wells. One microwell (DP-3) located near building 7 was advanced to a depth of 152 feet below grade, with groundwater samples collected at 10 to 20 foot intervals down to 130 feet. No chlorinated hydrocarbons were detected below the 20 foot interval. Low levels (less than 6 ppb) of toluene, ethylbenzene, and xylene were detected in groundwater to a depth of 70 feet. Deeper samples were non detect.

A. Chlorinated hydrocarbons. The site-wide sampling rounds in 1993 and 1996 detected vinyl chloride, TCE, PCE, and 1,2-DCE in several wells above their respective MCLs in two separate areas. Area 1 encompasses a large portion of the south western facility yard in the general vicinity of former building 7. Area 2 includes the eastern portion of former building 4 and GZ93-4 which is located downgradient of former building 9.

Area 1. Results of the groundwater sampling rounds in 1993 and 1996 showed that the highest concentrations of chlorinated hydrocarbons were detected in GZ93-8 (23 ppb vinyl chloride; 230 ppb 1,2-DCE; 370 ppb TCE; and 96 ppb PCE), which is located approximately 15 feet south of building 7. Chlorinated hydrocarbons were also detected in several other wells above MCLs in the area, including GZ93-6 (located approximately 50 feet northwest of building 7) and well GZ-3 (located approximately 110 feet east of building 7). Vinyl chloride was also detected in two of three off-site wells downgradient of this area, south of the train tracks (7 ppb of vinyl chloride in GZ-13, and 4 ppb of vinyl chloride in GZ-12). In an attempt to remediate groundwater in this area, two source areas were removed from beneath former building 7 during Phase III - Stabilization, and soils approximately 50 feet north of former building 7 are currently undergoing remediation via the SVE system. Groundwater monitoring wells downgradient of the vent wells have been sampled once prior to system startup and on three occasions since the SVE system has been running. Sampling results indicate that concentrations of chlorinated VOCs are decreasing markedly. Although concentrations of PCE, TCE, and vinyl chloride remain above MCLs in a few on-site wells, concentrations in off site wells downgradient from the train tracks (and Area 1) are now below MCLs.

Area 2. A groundwater sample collected in 1993 from GZ93-4 contained vinyl chloride (21 ppb) and PCE (11 ppb). No VOCs were detected in this well during the 1996 sampling round. The soil gas survey conducted in 1997 identified the eastern portion of former building 4 as having elevated chlorinated hydrocarbons in soil gas. Area 2 is currently being remediated by the SVE system and groundwater is being monitored in several wells downgradient of Area 2. No obvious trends are noted in the 3 sampling rounds of downgradient wells since the SVE system startup. Vinyl chloride was detected once at 2 ppb in GZ93-4 since the SVE system startup. In the most recent sampling conducted in July 2000, PCE was detected in well GZ99-26 at a concentration of 12 ppb. No VOCs have been detected above MCLs in well GZ99-27 located approximately 80 feet downgradient of Vent well #4.

B. BTEX. The petroleum related compounds benzene, ethylbenzene, toluene, and xylenes (BTEX) have been detected in several areas. The most significant concentrations are in the area of the two former 12,000 gallon heating oil tanks located along the southern property boundary. LNAPL is present in this area and four skimmer pumps have been installed to remove product. In addition, 1,400 tons of soil have been removed from this area as part of a pilot test to remediate the soils. Although wells have not been installed on the adjacent Amtrak property, it is likely that the LNAPL has migrated onto the Amtrak property. Petroleum hydrocarbon contamination has not been detected in three wells located downgradient from the train tracks on the UNC property.

The second area where BTEX has been found is GZ96-19. This well is located within approximately 50 feet of the former 10,000 gallon heating oil UST which was removed in 1994. Benzene (17 ppb) and naphthalene (63 ppb) have been detected in a groundwater sample from this well.

Benzene has also been detected in one of two samples collected from well GZ93-13 at a concentration of 11 ppb. This well is located directly downgradient of the former lagoons.

C. Metals. Metals have been detected in ground water samples above MCLs sporadically. Relatively low concentrations of thallium (max concentration 8.7 ppb) were detected in several wells. Mercury was detected at a concentration of 7.6 ppb in well GZ93-14, located downgradient of the former lagoons. Lead was detected in MW-1005 at a concentration of 55.2 ppb. Cadmium (27.7 ppb), and lead (58.2 ppb) were detected in well GZ93-13, which is downgradient of the former lagoons. Elevated concentrations of zinc (16,700 ppb) have been detected in well GZ93-5.

Surface Water. The Phase II-A RFI (1993) included sampling of the surface waters of the Pawcatuck River, and the marsh downgradient from the lagoons prior to removal of the lagoon sediments. Annual surface water sampling since 1996 has been performed in the reconstructed wetlands.

Five Pawcatuck River surface water samples were collected prior to the lagoon stabilization efforts, including a background surface water sample. Results of VOC, SVOC, and PCB/Pesticide analyses did not detect concentrations above risk based levels.

Two marsh surface water samples were collected hydraulically downgradient from the lagoons in 1993, prior to lagoon stabilization activities. Results of VOC, SVOC, and PCB/Pesticide analyses did not detect concentrations above risk based levels. Zinc was detected at a concentration of 713 ppb in one marsh sample (MSW-1) in a low lying area of standing water immediately downgradient from the northern lagoon. The EPA AWQC for zinc is 100 ppb. Dissolved antimony was detected at an estimated concentration of 28.7 ppb in a sample (MSW-2) collected downgradient of the northern lagoon. Lead was detected at estimated concentrations of 21 ppb and 11 ppb in MSW-1 and MSW-2, respectively, above the AWQC of 2.5 ppb. Additional surface water sampling in this area may be warranted to evaluate post remedial conditions downgradient from the lagoons.

Surface waters of the reconstructed wetlands have been sampled for total metals annually since 1996. Results indicate that there have been sporadic, minor exceedances of AWQC for aluminum, copper, lead, and zinc. The most recent sampling data collected in 1999 indicate that there are slight exceedances for the metals lead and aluminum. Given the likely high levels of naturally occurring organic acids and iron hydroxides with which lead and aluminum form complexes, it is unlikely that aquatic or semi-aquatic organisms in the wetland are being adversely impacted.

Sediments.

A. SVOCs were detected in a Pawcatuck River background sediment sample collected in 1993 at a concentration of over 106 ppm total SVOCs. Two additional background samples collected in 1996 detected much lower total SVOC concentrations. Three river sediment samples exceeded the Long and Morgan ER-L effects range. The background sample also exceeded the ER-M values. Benzo(a)pyrene was detected in two sediment samples at concentrations of 0.97 ppm (MSED-3 located downgradient from the northern lagoon) and 1.3 ppm (SED-2, located downstream in the Pawcatuck River), which slightly exceed RIDEM industrial/commercial direct exposure numbers. Di-n-butylphthalate was detected in two confirmatory samples (CS-011 and CS-100) collected from the northern lagoon at concentrations of 7.2 ppm and 1.4 ppm, respectively.

B. Pesticides. The background river sediment sample contained 4,4-DDD at a concentration of 23 ppb. A marsh sediment sample contained Dieldrin, 4,4 DDD and 4,4 DDT at concentrations of 33 ppb, 66 ppb, and 37 ppb respectively. All of these concentrations are above the Long and Morgan ER-L and ER-M values.

C. Metals. Generally low levels of metals were detected in both Pawcatuck River sediments and marsh sediments. One river sediment sample (SED-3) was contained a metal in excess of the ER-L value (Hg detected at 190 ppb, exceeding the ER-L of 150 ppb). Lead

and arsenic were detected in a marsh sediment sample (MSED-3, located downgradient from the northern lagoon) at a concentration of 2,070 ppm and 13 ppm, respectively.

Site Access. The site is currently vacant except for several small sheds housing the skimmer pumps and SVE system. The former manufacturing portion of the site is fenced. The reconstructed wetlands are not fenced. There is potential for scaling the fence and trespassing onto the former manufacturing area. There is also possible recreational use of the reconstructed wetlands and Pawcatuck River. It is possible that people could enter into the marsh area, although it is not an easy place to get to and the frequency of exposure is probably low.

2. *Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?*

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X	___	___	Tables 1 through 1e. VOCs, SVOC, PCBs/Pest, and metals compared to RIDEM GAA and EPA MCLs. VOCs, SVOCs, and Pest also compared to Region III tap.
Air (indoors)[2]	___	X	___	No structures on Site
Surface Soil (e.g., <2 ft)	X	___	___	Tables 2 through 2c. VOCs, SVOCs, PCB/Pest, and metals compared to Ind/com RIDEM and Region III direct exposure #s. VOC, SVOC, and PCBs also compared to RIDEM GA leach #s.
Surface Water	X	___	___	Tables 3 through 3d. VOCs, SVOCs, metals, and PCB/Pest compared to RIDEM HH Non-class A and EPA AWQS for HH water & org #s.
Sediment	X	___	___	Tables 4 through 4c. VOCs, SVOCs, PCBs/Pest and metals compared to ind/com RIDEM and Region III direct exp #s. VOCs, SVOCs, and PCBs also compared to RIDEM GA Leach #s.
Subsurf. Soil (e.g., >2 ft)	X	___	___	Tables 5 through 5c VOCs, SVOCs, PCB/Pest, and metals compared to ind/com RIDEM and Region III direct exposure #s. VOC, SVOC, and PCBs also compared to RIDEM GA leach #s.

Air (outdoors) ___ X ___ Not likely, though not sampled

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Media: Contaminants of Potential Concern

1. Groundwater: tetrachloroethene and its degradation byproducts; 1,2-dichloropropane; petroleum related aromatics; thallium; lead, zinc, and cadmium.
2. Surficial Soil: arsenic in wetland soil samples.
3. Sediment: Benzo(a)pyrene, arsenic, and lead.
4. Subsurface Soil: tetrachloroethene and its degradation byproducts; petroleum related aromatics (e.g., benzene); di-n-butylphthalate; arsenic; lead; zinc
5. Surface Water: One exceedence of a standard for antimony in a marsh sample.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. *Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions*?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	No	No	No	No
~~Air (indoors)~~							
Soil (surface, e.g., <2 ft)	No	No	No	No	No	Yes	No
Surface Water	No	No	No	No	No	Yes	No
Sediment	No	No	No	No	No	Yes	No
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s): The property is currently undeveloped, and there are no known plans to develop the property in the near future. Therefore, there are no current resident, worker, day care, construction, or food exposures. The former manufacturing area is fenced, and there is no remaining contaminated surficial soil in this area, so there is no potential exposure to a trespasser. The only potential complete exposure pathway is a recreator exposed to wetland surface soils, surface water, and sediment downgradient from the former lagoons or in or near the Pawcatuck River. If the property is developed in the future, construction workers should be required to take necessary precautions to avoid exposures to on-site groundwater or subsurface soils. This issue

should be addressed in the final RFI/ risk assessment for the site.

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4 *Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?*

__X__ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Surface Soil: Arsenic is the contaminant of concern in wetland surface soils. There is no documented usage of arsenic at the Site and arsenic was not detected at significant concentrations in on Site soils or in the former lagoons. The elevated arsenic concentrations were detected in the river bank soils which are not believed to be attributable to site related activities. Also, the RIDEM and EPA criteria for arsenic regulatory standards were developed assuming residential and/or industrial/commercial exposures. The recreator exposures are expected to be significantly less intensive (i.e., exposure frequency, duration, etc.). Additionally, due to the location of the elevated arsenic concentrations (on the river bank), the potential for any direct exposure is extremely low.

Sediments: The only contaminants detected in sediments above the standards are arsenic, lead, and benzo(a)pyrene. Arsenic and lead were detected at concentrations above RIDEM's Industrial/Commercial Direct Exposure Criteria only once and in the same sample collected from the marsh north of the former lagoons. There is no documented use of arsenic during former operations at the facility and arsenic was not detected at elevated levels in the former

lagoon sediments. The arsenic detected in the marsh may not be attributable to site related activities. Lead was detected in the marsh sediments at levels above the standard and was also detected in the former lagoon sediments at elevated levels. Although, the lead in the marsh sediments is most likely attributed to Site related activities, the potential human health exposure is not considered significant due to the nature of the location from which the sample was obtained. Benzo(a)pyrene was detected in one marsh sample and one river sample at concentrations slightly above RIDEM industrial/commercial direct exposure numbers. The marsh is a heavily vegetated and perennially inundated area resulting in a very low potential for human exposure. The standards are based on industrial/commercial exposures that are anticipated to be much more intensive than a recreator exposure (i.e., exposure frequency and duration).

Surface water: Antimony was detected in one surface water sample at an estimated concentration of 28.7 ppb, above the AWQC for freshwater organism protection and human health. The sample was collected in a marsh, downgradient from the lagoon before lagoon stabilization activities. The potential for human exposure is not considered significant due to the nature of the location from which the sample was collected.

If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 *Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable limits**?*

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):_____

6. *Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date*

on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Agency Realty (Carroll Products) facility, EPA ID # **RID002042216**, located at 477 Church Street in Richmond, Rhode Island under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) Robert W. Brackett Date 9/11/00
(print) Robert W. Brackett
(title) RCRA Facility Manager

Supervisor (signature) Matthew R. Hogsland Date 9/11/00
(print) Matthew R. Hogsland
(title) Section Chief
(EPA Region or State) EPA-NE

Contact telephone and e-mail numbers
(name) Robert W. Brackett
(phone #) (617) 918-1364
(e-mail) Brackett.Bob@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Carroll Products
Facility Address: 477 Church Street, Richmond, RI
Facility EPA ID #: **RID002042216**

1. *Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?*

   X If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available, skip to #8 and enter"IN" (more information needed) status code.

FACILITY BACKGROUND INFORMATION

For a description of the facility and current conditions, see the Facility Background Information section contained in the attached CA725.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. *Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?*

   _X_ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

   _____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

   _____ If unknown - skip to #8 and enter "IN" status code.

   Rationale and Reference(s): As indicated on Tables 1 through 1e, various VOCs and metals have been detected in on-site and off-site wells at concentrations above MCLs. The contaminants of potential concern include: tetrachloroethene and its degradation by-products; 1,2-dichloropropane; petroleum related aromatics, thallium, lead, mercury, and zinc.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. *Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?*

X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): The detected groundwater contamination is expected to remain within the existing area of groundwater contamination allowing for a limited area of natural attenuation. This statement is based on monthly gauging and quarterly sampling of several wells, and three site-wide rounds of groundwater monitoring data that generally indicates the contamination has stabilized and/or is decreasing with time due to natural attenuation and substantial remediation efforts which focused on removal of the major identified sources of groundwater contamination. Two sources of chlorinated VOC groundwater contamination are currently being remediated via soil vapor extraction. Recent groundwater monitoring data downgradient of the two source areas show decreasing or stable concentrations. Although petroleum contaminated soils and LNAPL remain in the former UST release area, skimmer pumps are continuing to remove LNAPL, and monthly monitoring of the extent of petroleum contamination shows that the highly viscous, weathered #4/6 oil is not migrating. Off-site wells GZ-11, GZ-12, and GZ-13, located downgradient of both the UST release area and Area 1 of the SVE system have never shown any detections of petroleum related contamination. Recent monitoring results show that levels of vinyl chloride in these wells have decreased to at or below the MCL.

Several wells (GZ93-13, GZ93-14, GZ93-15, GZ93-16, GZ93-17, and MW1005) are located on-site, downgradient of the former lagoons. Groundwater sampling of these wells was conducted in 1996, after the lagoons were remediated. The following "hits" were above MCLs and/or AWQC: mercury (7.6 ppb), lead (55 ppb), thalium (5 ppb), zinc (1,350 ppb), and benzene (11 ppb). Since the source (the lagoons) has been removed, it is anticipated that concentrations of these contaminants in groundwater have decreased since 1996. Additional groundwater samples will be collected prior to completion of the RFI to verify this assumption.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater

contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. *Does "contaminated" groundwater **discharge** into **surface water** bodies?*

____ If yes - continue after identifying potentially affected surface water bodies.

X If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): As indicated on Table 1, the only contaminant detected above regulatory criteria in off-site wells was vinyl chloride. The levels detected were marginally higher than the applicable standard (i.e., 3 to 7 ug/l vs. MCL of 2 ug/l). The most recent results indicate levels of vinyl chloride do not exceed 2 ppb in these wells. Several wells (GZ93-13, GZ93-14, GZ93-15, GZ93-16, GZ93-17, and MW1005) are located on-site, downgradient of the former lagoons. Groundwater sampling of these wells was conducted in 1996, after the lagoons were remediated. The following "hits" were above MCLs and/or AWQC: mercury (7.6 ppb), lead (55 ppb), thalium (5 ppb), zinc (1,350 ppb), and benzene (11 ppb). These wells are all located more than 300 feet upgradient of the Pawcatuck River, where any groundwater discharge would likely be below State and Federal Ambient Water Quality Criteria due to natural attenuation. It is very likely that dilution into the Pawcatuck River would make any contaminant discharge from the site undetectable.

5. *Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?*

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not

anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>each</u> contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and
Reference(s):_____

_____

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. *Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?*

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR

2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and

sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and
Reference(s): _____

_____

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. *Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"*

X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): RIDEM requires monthly monitoring of petroleum product thickness and extent in the vicinity of a historic release of No. 4/6 oil. Additional

groundwater monitoring is also being conducted at and downgradient from the SVE system. The results of the proposed monitoring will be used to evaluate if the groundwater contamination is attenuating subsequent to source removal actions and evaluate the effectiveness of the SVE system. In addition, EPA has indicated to Sequa and GZA that at least one additional round of groundwater monitoring will be needed to complete the risk assessment and RFI. Additional surface water and sediment sampling should be performed in the wetlands downgradient of the former lagoons

8. *Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).*

X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Agency Realty (Carroll Products) facility , EPA ID # **RID002042216**, located at 477 Church Street in Richmond, Rhode Island. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by (signature) Robert W. Brackett Date 9/11/00
(print) Robert W. Brackett
(title) RCRA Facility Manager

Supervisor (signature) [signature] Date 9/11/00
(print) Matthew R. Haagland
(title) Section Chief
(EPA Region or State) EPA-NE

Contact telephone and e-mail numbers

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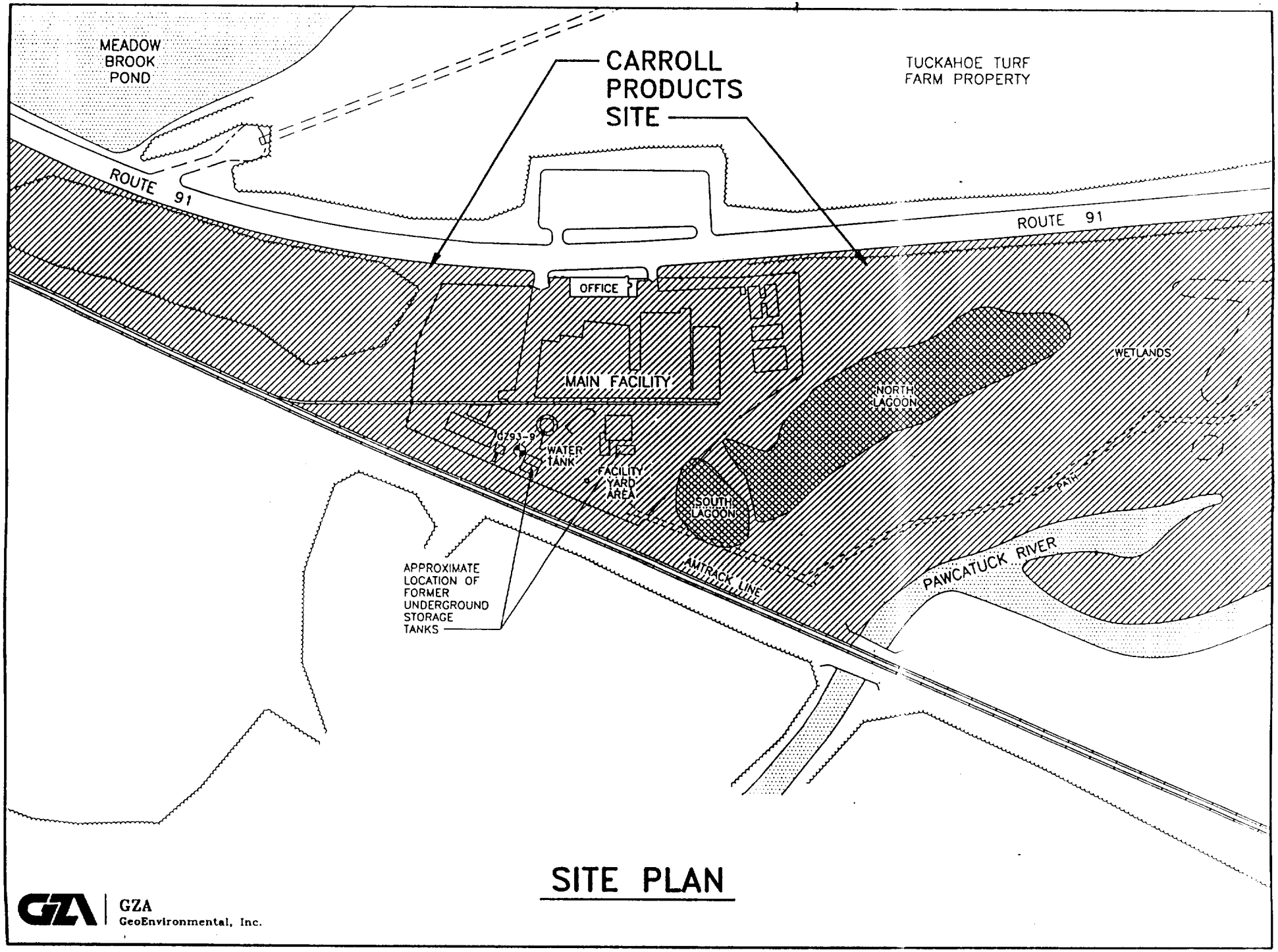

SITE PLAN

GZA
GeoEnvironmental, Inc.

GROUNDWATER ANALYTICAL RESULTS - VOCs

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	Standards for Comparison: RIDEM[1] GAA	USEPA MCL	REG. III TAP WATER	GZ93-1 10/28/1993	GZ93-1 10/28/93BD	GZ93-1 11/19/1996	GZ93-2 10/28/1993	GZ93-2 11/18/1996	GZ93-3 10/28/1993	GZ93-3 11/18/1996	GZ93-4 10/28/1993	GZ93-4 11/18/1996	GZ93-5 10/28/1993	GZ93-5 11/21/1996	GZ93-6 10/29/1993	GZ93-7 10/29/1993	GZ93-7 11/18/1996	GZ93-8 11/3/1993	GZ93-8 11/21/1996	GZ93-9 10/29/1993	GZ93-10 10/29/1993	GZ93-11 11/3/1993	GZ93-12 10/29/1993	GZ93-12 11/18/1996	GZ93-13 11/1/1993	GZ93-13 1/1/93BD	GZ93-13 11/21/1996	GZ93-14 11/1/1993	GZ93-14 11/19/1996
Chloromethane	ug/l			1.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ug/l			8.7E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ug/l	2.0E+00	2.0E+00	1.9E-02	ND	ND	ND	ND	ND	ND	ND	21	ND	8	ND	ND	ND	ND	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ug/l			8.6E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/l			1.3E+03																										
Carbon Disulfide	ug/l			1.0E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/l	7.0E+00	7.0E+00		ND	ND	ND	ND	ND	ND	ND	2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l			8.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ug/l			7.5E-04																										
1,2-Dichloroethene (total)	ug/l		7.0E+01		ND	ND	ND	ND	ND	ND	ND	9 J	ND	16	ND	14	ND	ND	230	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ug/l			3.7E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5.0E+00		4.1E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2 J	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/l		8.0E+01	1.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	5.0E+00	5.0E+00	1.2E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/l	5.0E+00	5.0E+00	3.6E-01	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND	ND	ND	ND	ND	ND	ND	62	ND	1 J	ND	ND	ND	ND	11	ND	ND
1,1,1-Trichloroethane	ug/l	2.0E+02	2.0E+02	7.9E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	5.0E+00	5.0E+00	1.6E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/l			1.7E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/l	5.0E+00	5.0E+00	1.6E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ug/l																													
2,2-dichloropropane	ug/l																													
1,1-Dichloropropene	ug/l																													
cis-1,3-Dichloropropene	ug/l			7.7E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/l	5.0E+00	5.0E+00		ND	ND	ND	ND	1 J	ND	ND	5 J	ND	11	8	87	ND	ND	370	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/l	5.0E+00	5.0E+00	1.9E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/l			1.5E-03																										
Bromoform	ug/l		8.0E+01	2.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/l			5.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ug/l			4.1E-01																										
2-Chlorotoluene	ug/l																													
4-Chlorotoluene	ug/l																													
1,3,5-Trimethylbenzene	ug/l			3.0E+02																										
1,2,4-Trimethylbenzene	ug/l			3.0E+02																										
Bromochloromethane	ug/l						ND		ND		ND		ND		ND			ND		ND					ND			ND		ND
1,2-Dibromomethane	ug/l						ND		ND		ND		ND		ND			ND		ND					ND			ND		ND
1,2,4-Trichlorobenzene	ug/l		7.0E+01	1.9E+02			ND		ND		ND		ND		ND			ND		ND					ND			ND		ND
p-Isopropyltoluene	ug/l																													
Toluene	ug/l	1.0E+03	1.0E+03	7.5E+02	ND	ND	ND	ND	0.6 J	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	0.6 J	ND	ND	ND	ND	ND
Tetrachloroethene	ug/l	5.0E+00	5.0E+00		ND	ND	ND	ND	ND	ND	ND	11	ND	16	ND	8 J	ND	ND	96	1	ND	ND	ND	ND	1	ND	ND	ND	ND	ND
Chlorobenzene	ug/l	1.0E+02		3.9E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	61 J	50	41	ND	ND
Ethylbenzene	ug/l	7.0E+02	7.0E+02	1.0E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	26	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ug/l	1.0E+02	1.0E+02	1.6E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ug/l	1.0E+04	1.0E+04	1.2E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	64	ND	13	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			3.9E+02																										
Dibromomethane	ug/l																													
Dichloromethane	ug/l		5.0E+00																											
Bromobenzene	ug/l																													
Acrolein	ug/l			7.3E+02																										
Acrylonitrile	ug/l			1.2E-01																										
Vinyl Acetate	ug/l			3.7E+04																										
Methyl Tert Butyl Ether	ug/l	4.0E+01		1.8E+02																										
2-Chloroethylvinylether	ug/l			1.5E+02																										
Chloroform	ug/l		8.0E+01	1.5E-01																										
Isopropylbenzene	ug/l																													
N-Propylbenzene	ug/l																													
tert-Butylbenzene	ug/l			6.1E+01																										
sec-Butylbenzene	ug/l			6.1E+01																										
n-Butylbenzene	ug/l																													
1,2-Dibromo-3-Chloropropane	ug/l	2.0E-01	2.0E-01	4.8E-02			ND		ND		ND		ND		ND			ND		ND					ND			ND		ND
Hexachlorobutadiene	ug/l			1.4E-01																										
Naphthalene	ug/l																													
1,3-Dichlorobenzene	ug/l	6.0E+02		5.4E+02			ND		ND		ND		ND		ND			ND		ND	ND				ND			ND		ND
1,4-Dichlorobenzene	ug/l	7.5E+01	7.5E+01	4.4E-01			ND		ND		ND		ND		ND			ND		ND	ND				ND			ND		ND
1,2-Dichlorobenzene	ug/l	6.0E+02	6.0E+02	2.7E+02			ND		ND		ND		ND		ND			ND		ND	ND				ND			ND		ND

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - VOCs

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	Standards for Comparison: RIDEM[a] GAA	RIDEM[a] MCL	USEPA[b] REG. RL, TAP WATER	PHASE IIA/IIB RFI DATA: GZ93-15		GZ93-16		GZ98-17		GZ98-18	GZ98-19	GZ98-21	GZ98-22	GZ98-23	GZ-11		GZ-12			GZ-13		MW-1001	MW-1006	Site Well	DP-3-12	DP-3-70	DP-3-130	MCW-3C	PHASE IIIB/IIA RFI DATA: MCW-3	MCW-3B
					11/1/1993	11/10/1998	11/1/1993	11/10/1998	11/1/1993	11/25/1998	11/30/1998	11/30/1998	11/21/1998	11/25/1998	11/30/1998	9/28/1998	11/20/1998	9/28/1998	11/20/1998	1/21/1999	9/28/1998	11/25/1998	11/10/1998	11/1/1993	11/20/1998	4/11/1996	12/11/1998	12/11/1998	12/12/1998	4/15/1996	4/15/1996	4/15/1996
Chloromethane	ug/l			1.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ug/l			8.7E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ug/l	2.0E+00	2.0E+00	1.9E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	4	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ug/l			8.6E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/l			1.3E+03																										
Carbon Disulfide	ug/l			1.0E+03	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/l	7.0E+00	7.0E+00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l			8.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ug/l			7.5E-04																											
1,2-Dichloroethene (total)	ug/l		7.0E+01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	7	ND	ND	ND	ND	ND
Acetone	ug/l			3.7E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5.0E+00		4.1E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/l		8.0E+01	1.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethane	ug/l	5.0E+00	5.0E+00	1.2E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/l	5.0E+00	5.0E+00	3.6E-01	ND	ND	ND	ND	ND	ND	17	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	1.4	1.1	ND
1,1,1-Trichloroethane	ug/l	2.0E+02	2.0E+02	7.9E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	1.4	1.1	ND
Carbon Tetrachloride	ug/l	5.0E+00	5.0E+00	1.6E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/l			1.7E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/l	5.0E+00	5.0E+00	1.6E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ug/l																															
1,3-dichloropropene	ug/l																															
1,2-Dichloropropane	ug/l																															
trans-1,3-Dichloropropene	ug/l			7.7E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/l	5.0E+00	5.0E+00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/l	5.0E+00	5.0E+00	1.9E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/l			1.5E-03																											
Hexachlorobutadiene	ug/l		8.0E+01	2.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ug/l			5.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/l			4.1E-01																											
Chlorobenzene	ug/l																															
Ethylbenzene	ug/l																															
1,3,5-Trimethylbenzene	ug/l			3.0E+02																												
1,2,4-Trimethylbenzene	ug/l			3.0E+02																												
Dibromochloromethane	ug/l					ND		ND		ND	ND	ND	ND	ND	ND		ND			ND		ND	ND		ND		ND	ND	ND	ND	ND
1,2-Dibromoethane	ug/l					ND		ND		ND	ND	ND	ND	ND	ND		ND			ND		ND	ND		ND		ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/l		7.0E+01	1.9E+02		ND		ND		ND	ND	ND	ND	ND	ND		ND			ND		ND	ND		ND		ND	ND	ND		
Isopropylbenzene	ug/l																ND					ND	ND		ND		ND	ND	ND	ND	ND
Styrene	ug/l	1.0E+03	1.0E+03	7.5E+02	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	4	ND	2.7	ND	ND
Tetrachloroethene	ug/l	5.0E+00	5.0E+00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND	1.8	1
Monobenzene	ug/l	1.0E+02		3.9E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6 J	1	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/l	7.0E+02	7.0E+02	1.0E+03	ND	ND	ND	ND	ND	ND	19	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND
Toluene	ug/l	1.0E+02	1.0E+02	1.6E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ug/l	1.0E+04	1.0E+04	1.2E+04	ND	ND	ND	ND	ND	ND	56	ND	18	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	2	ND	1.7	ND	ND
Dichlorodifluoromethane	ug/l			3.9E+02																												
Bromomethane	ug/l																															
Dichloromethane	ug/l		5.0E+00																													
Monochlorobenzene	ug/l																															
Xylenes	ug/l			7.3E+02																												
Acrylonitrile	ug/l			1.2E-01												ND		ND			ND				ND				ND	ND	ND
Vinyl Acetate	ug/l			3.7E+04												ND		ND			ND				ND				ND	ND	ND
Methyl Tert Butyl Ether	ug/l	4.0E+01		1.8E+02												ND		ND			ND				ND				ND	ND	ND
Chloroethylvinylether	ug/l			1.5E+02												ND		ND			ND				ND				ND	ND	ND
Bromoform	ug/l		8.0E+01	1.5E-01												ND		ND			ND				ND				ND	ND	ND
Isopropylbenzene	ug/l															ND		ND			ND				ND				ND	ND	ND
Propylbenzene	ug/l																															
n-Butylbenzene	ug/l			6.1E+01																												
sec-Butylbenzene	ug/l			6.1E+01																												
tert-Butylbenzene	ug/l																															
1,2-Dibromo-3-Chloropropane	ug/l	2.0E-01	2.0E-01	4.8E-02		ND		ND		NO	ND	ND	ND	ND	ND		ND			ND		ND	ND		ND		ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/l			1.4E-01																												
Naphthalene	ug/l																															
1,2,3-Trichlorobenzene	ug/l	6.0E+02		5.4E+02		ND		ND		NO	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/l	7.5E+01	7.5E+01	4.4E+01		ND		ND		NO	ND	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Units	Standards for Comparison: RIDEM[1] GAA	USEPA MCL[2]	Reg. III TAP WATER[3]	PEASE REMEDIAL INVESTIGATION DATA: MCW-1 4/14/1995	MCW-2 4/17/1995	LUST INVESTIGATION DATA: GZ-1 1/6/1995	GZ-2 1/6/1995	GZ-3 1/6/1995	GZ-4 1/6/1995	GZ-5 1/6/1995	GZ-6 1/6/1995	GZ-7 1/6/1995	GZ-8 1/6/1995	GZ-9 1/6/1995	GZ-10 1/6/1995	GZ83-8 1/6/1995
Chloromethane	ug/l			1.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ug/l			8.7E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ug/l	2.0E+00	2.0E+00	1.9E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ug/l			8.6E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/l			1.3E+03	ND	ND											
Carbon Disulfide	ug/l			1.0E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/l	7.0E+00	7.0E+00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l			8.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ug/l			7.5E-04	ND	ND											
1,2-Dichloroethene (total)	ug/l		7.0E+01		ND	22	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ug/l			3.7E+03	ND	ND	ND	ND	ND	ND	ND	1400	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5.0E+00		4.1E+02			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/l		8.0E+01	1.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	5.0E+00	5.0E+00	1.2E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/l	5.0E+00	5.0E+00	3.6E-01	ND	ND	38	ND	ND	ND	ND	22	ND	19	14	ND	78
1,1,1-Trichloroethane	ug/l	2.0E+02	2.0E+02	7.0E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	5.0E+00	5.0E+00	1.6E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/l			1.7E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/l	5.0E+00	5.0E+00	1.6E-01	ND	ND	ND	ND	ND	100	89	ND	ND	33	ND	ND	ND
1,3-Dichloropropene	ug/l				ND	ND											
2,2-dichloropropane	ug/l				ND	ND											
1,1-Dichloropropene	ug/l				ND	ND											
cis-1,3-Dichloropropene	ug/l			7.7E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/l	5.0E+00	5.0E+00		ND	11	ND	77	84	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/l	5.0E+00	5.0E+00	1.9E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropene	ug/l			1.5E-03	ND	ND											
Bromoform	ug/l		8.0E+01	2.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/l				ND	ND	ND	ND	ND	1200	ND	23	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethene	ug/l			5.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ug/l			4.1E-01	ND	ND											
2-Chlorotoluene	ug/l				ND	ND											
4-Chlorotoluene	ug/l				ND	ND											
1,3,5-Trimethylbenzene	ug/l			3.0E+02	ND	ND											
1,2,4-Trimethylbenzene	ug/l			3.0E+02	ND	ND											
Bromochloromethane	ug/l				ND	ND											
1,2-Dibromomethane	ug/l																
1,2,4-Trichlorobenzene	ug/l		7.0E+01	1.9E+02	ND	ND											
p-Isopropyltoluene	ug/l				ND	ND											
Toluene	ug/l	1.0E+03	1.0E+03	7.5E+02	ND	ND	ND	ND	ND	89	ND	120	ND	ND	ND	ND	ND
Tetrachloroethene	ug/l	5.0E+00	5.0E+00		ND	130	ND	74	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/l	1.0E+02		3.9E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/l	7.0E+02	7.0E+02	1.0E+03	ND	ND	190	ND	ND	78	37	74	ND	ND	41	93	53
Styrene	ug/l	1.0E+02	1.0E+02	1.6E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ug/l	1.0E+04	1.0E+04	1.2E+04	ND	ND	650	ND	ND	360	152	550	ND	ND	185	500	255
Dichlorodifluoromethane	ug/l			3.9E+02	ND	ND											
Dibromomethane	ug/l				ND	ND											
Dichloromethane	ug/l		5.0E+00		ND	ND											
Bromobenzene	ug/l				ND	ND											
Acrolein	ug/l			7.3E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ug/l			1.2E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Acetate	ug/l			3.7E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert Butyl Ether	ug/l	4.0E+01		1.8E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ug/l			1.5E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/l		8.0E+01	1.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l				ND	ND											
N-Propylbenzene	ug/l				ND	ND											
tert-Butylbenzene	ug/l			6.1E+01	ND	ND											
sec-Butylbenzene	ug/l			6.1E+01	ND	ND											
n-Butylbenzene	ug/l				ND	ND											
1,2-Dibromo-3-Chloropropane	ug/l	2.0E-01	2.0E-01	4.8E-02	ND	ND											
Hexachlorobutadiene	ug/l			1.4E-01	ND	ND											
Naphthalene	ug/l				ND	ND											
1,3-Dichlorobenzene	ug/l	6.0E+02		5.4E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/l	7.5E+01	7.5E+01	4.4E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/l	6.0E+02	6.0E+02	2.7E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes

1 RIDEM = Rhode Island Department of Environmental Management. The standards listed are taken from "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases". The standards are from Table-3 - GA Groundwater Objectives.

2 USEPA MCL = United States Environmental Protection Agency Maximum Contamination Level

3 Reg III Tap Water taken from EPA Region III Risk-Based Concentration Table (3/11/97), except for Methylnaphthalene, 4,4-DDD, and 4,4-DDT, which were taken from the groundwater standards of North Carolina

Carroll Products Facility
Richmond, Rhode Island

Analyte	Units	Standards for Comparison			Phase IIA/IIB Data																					
		RIDEM[1]	USEPA	REG. III	GZ93-1			GZ93-2	GZ93-3		GZ93-4	GZ93-5		GZ93-6	GZ93-7	GZ93-8			GZ93-10	GZ93-11	GZ93-12		GZ93-13		
		GAA	MCL	TAP WATER	10/28/1993	10/28/1993D	11/15/1996	10/28/1993	10/28/1993	11/18/1996	10/28/1993	10/28/1993	11/21/1996	10/28/1993	10/28/1993	11/3/1993	11/21/1996	11/21/1996	10/28/1993	11/3/1993	10/28/1993	11/18/1996	11/1/1993	11/1/1993D	11/21/1996
Phenol	ug/l	--		2.2E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	2 J
bis(2-Chloroethyl)ether	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	ug/l			1.8E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/l	6.0E+02		5.4E+02	ND	ND		ND	ND		ND	ND		ND	R	ND			ND	ND	ND		ND	ND	
1,4-Dichlorobenzene	ug/l	7.5E+01	7.5E+01	4.4E-01	ND	ND		ND	ND		ND	ND		ND	R	ND			ND	ND	ND		ND	ND	
1,2-Dichlorobenzene	ug/l	6.0E+02	6.0E+02	2.7E+02	ND	ND		ND	ND		ND	ND		ND	R	ND			ND	ND	ND		ND	ND	
2-Methylphenol	ug/l			1.8E+03	ND	ND	ND	ND	ND	ND	ND	3 J	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2'-oxybis(1-Chloropropane)	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	ug/l			1.8E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-propylamine	ug/l			9.6E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	ug/l			7.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	ug/l			3.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ug/l			7.1E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/l			7.3E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethoxy)methane	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	ug/l			1.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/l	7.0E+01	7.0E+01	1.0E+00	ND	ND		ND	ND		ND	ND		ND	R	ND			ND	ND	ND		ND	ND	
Naphthalene	ug/l	2.0E+01		1.9E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	ug/l			1.5E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	31	ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/l			1.4E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylnaphthalene	ug/l			2.8E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ug/l		5.0E+01	1.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ug/l			6.1E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	ug/l			3.7E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	ug/l			2.2E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethylphthalate	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ug/l			2.2E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	ug/l			3.7E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	ug/l			1.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ug/l			7.3E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	ug/l			2.3E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	ug/l			1.5E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ug/l			7.3E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	ug/l			2.9E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl-phenylether	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ug/l			1.5E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	ug/l			1.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ug/l			1.4E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	9 J	ND	ND	ND	ND	ND	1 J
4-Bromophenyl-phenylether	ug/l			2.1E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorophenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ug/l	1.0E+00	1.0E+00	5.8E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ug/l			1.1E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ug/l																									
Di-n-butylphthalate	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	ug/l			3.4E+00	ND	ND		ND	ND		ND	ND		ND	R	ND			ND	ND	ND		ND	ND	
Fluoranthene	ug/l			1.5E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ug/l			1.1E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzylphthalate	ug/l			7.3E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	1 J	ND	ND	ND	ND	ND	ND	1 J
3,3-Dichlorobenzidine	ug/l			1.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/l			9.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ug/l			9.2E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	ug/l	6.0E+00			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ug/l			9.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ug/l			9.2E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/l	2.0E-01	2.0E-01	9.2E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ug/l			9.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ug/l			9.2E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

1. RIDEM = Rhode Island Department of [illegible]. Values listed are taken from "Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases". The standards are from Table-3-GA Groundwater Objectives
2. USEPA MCL = United States Environmental Protection Agency Maximum Contamination Level
3. Reg III Tap Water taken from EPA Region III Risk-Based Concentration Table (3/11/97), except for Methylnaphthalene, 4,4'-DDD, and 4,4'-DDT, which were taken from groundwater standards of North Carolina

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - SVOCs

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	Standards for Comparison			Phase IIA/IIB Data																			
		RIDEM[1]	USEPA	REG. III	GZ93-14	GZ93-15		GZ93-16	GZ96-17		GZ96-19	GZ96-20	GZ96-21	GZ96-22	GZ96-23	GZ-11	GZ-12		GZ-13	MW-1001	MW-1006		Site Well
		GAA	MCL	TAP WATER	11/1/1993	11/1/1993	11/19/1996	11/1/1993	11/1/1993	11/25/1996	11/20/1996	11/20/1996	11/21/1996	11/25/1996	11/20/1996	11/20/1996	11/20/1996	11/21/1996SD	11/25/1996	11/19/1996	11/1/1993	11/20/1996	4/11/1996
Phenol	ug/l			2.2E+04	ND	ND	ND	ND	ND	ND	ND	ND	6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethyl)ether	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	ug/l			1.8E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/l	6.0E+02		5.4E+02	ND	ND		ND	ND												ND		ND
1,4-Dichlorobenzene	ug/l	7.5E+01	7.5E+01	4.4E-01	ND	ND		ND	ND												ND		ND
1,2-Dichlorobenzene	ug/l	6.0E+02	6.0E+02	2.7E+02	ND	ND		ND	ND												ND		ND
2-Methylphenol	ug/l			1.8E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2'-oxybis(1-Chloropropane)	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	ug/l			1.8E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-propylamine	ug/l			9.6E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	ug/l			7.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	ug/l			3.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ug/l			7.1E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/l			7.3E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethoxy)methane	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	ug/l			1.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/l	7.0E+01	7.0E+01	1.0E+00	ND	ND		ND	ND												ND		ND
Naphthalene	ug/l	2.0E+01		1.9E+02	ND	ND	ND	ND	ND	ND	63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	ug/l			1.5E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/l			1.4E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylnaphthalene	ug/l			2.8E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ug/l		5.0E+01	1.5E-01	ND	ND	ND	ND	ND	ND	160	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ug/l			6.1E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	ug/l			3.7E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	ug/l			2.2E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethylphthalene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ug/l			2.2E+03	ND	ND	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	ug/l			3.7E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	ug/l			1.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ug/l			7.3E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	ug/l			2.3E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	ug/l			1.5E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ug/l			7.3E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	ug/l			2.9E+04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl-phenylether	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ug/l			1.5E+03	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	ug/l			1.1E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ug/l			1.4E+01	ND	ND	ND	ND	ND	ND	ND	1 J	8	16 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl-phenylether	ug/l			2.1E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorophenol	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ug/l	1.0E+00	1.0E+00	5.6E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ug/l				ND	ND	ND	ND	ND	ND	48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ug/l			1.1E+04	ND	ND	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ug/l																						ND
Di-n-butylphthalate	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	ug/l			3.4E+00	ND	ND		ND	ND									ND			ND		ND
Fluoranthene	ug/l			1.5E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ug/l			1.1E+03	ND	ND	ND	ND	ND	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzylphthalate	ug/l			7.3E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	ND
3,3-Dichlorobenzidine	ug/l			1.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/l			9.2E-02	ND	ND	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ug/l			9.2E+00	ND	ND	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	ug/l	6.0E+00			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ug/l			9.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ug/l			9.2E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/l	2.0E-01	2.0E-01	9.2E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ug/l			9.2E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ug/l			9.2E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes

1. RIDEM = Rhode Island Department of Environmental Management. The standards [illegible] Remediation of Hazardous Materials Releases". The standards are from Table 3-GA Groundwater Objectives
2. USEPA MCL = United States Environmental Protection Agency Maximum Contamination Level
3. Reg III Tap Water taken from EPA Region III Risk-Based Concentration Table (3/11/97), except for Methylnaphthalene, 4,4-DDD, and 4,4-DDT, which were from the groundwater standards of North Carolina

TABLE-1B
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS
Carroll Products Facility
Richmond, Rhode Island

Analyte	Units	Standards for Comparison		GZ93-1	GZ93-2	GZ93-3	GZ93-4	GZ93-5	GZ93-7	GZ93-8		GZ93-12	GZ93-13	GZ93-14	GZ93-15	GZ93-16	GZ93-17	GZ96-19	GZ96-20	GZ96-21	GZ96-22	GZ96-23	GZ-11
		RIDEM [1]	USEPA	11/19/1996	11/18/1996	11/18/1996	11/18/1996	11/21/1996	11/18/1996	11/21/1996	11/21/1996 BD	11/19/1996	11/21/1996	11/19/1996	11/19/1996	11/19/1996	11/25/1996	11/20/1996	11/20/1996	11/21/1996	11/25/1996	11/20/1996	11/20/1996
		GA/GAA	MCL																				
Aluminum	ug/l			277	356	99.4	ND	ND	1420	ND	ND	239	91.8	ND	78.2	ND	ND	653	237	89.1	98.7	ND	288
Antimony	ug/l	6.0E+00	6.0E+00	ND	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/l		5.0E+01	ND	5.5	5.1	ND	ND	11.4	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND	2.0	ND	ND
Barium	ug/l	2.0E+03	2.0E+03	7.2	198	35	25.2	72.5	124	ND	ND	64.3	ND	11.4	44.3	13.2	ND	ND	ND	35.3	42.1	ND	60.9
Beryllium	ug/l	4.0E+00	4.0E+00	0.6	1.2	0.58	ND	0.31	1.5	ND	ND	0.76	ND	ND	0.24	0.24	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	5.0E+00	5.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	ug/l			1130	4300	3200	10100	25500	3020	77400	81500	3190	21300	3630	2260	2700	312	20700	1170	4300	4860	3800	2820
Chromium	ug/l	1.0E+02	1.0E+02	1.2	1.7	0.57	1.1	ND	2.1	ND	ND	0.83	ND	3.6	1.7	0.96	ND	ND	2.5	9.8	6.2	ND	0.62
Cobalt	ug/l			ND	2.5		1.3	ND	1	ND	ND	2	ND	ND	0.95	0.92	ND	101	0.31	0.55	3.1	ND	0.46
Copper	ug/l		1.3E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	ug/l			ND	ND	ND	24500	15500	ND	42600	45000	3180	30000	969	2780	9610	924	32400	2920	3550	8870	5720	1490
Lead	ug/l	1.5E+01	1.5E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	ug/l			468	819	793	2020	9100	738	811	848	425	679	640	852	679	ND	2140	ND	4320	711	787	765
Manganese	ug/l			46	126	331	1240	553	178	374	396	74.1	1490	1300	454	457	ND	1720	455	490	790	1770	528
Mercury	ug/l	2.0E+00	2.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/l	1.0E+02	1.0E+02	ND	2.5	ND	ND	17.9	1.2	ND	ND	1.6	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	3.1
Potassium	ug/l			1050	9140	3400	1600	9500	7270	ND	ND	6610	ND	2310	1000	1910	ND	9800	3340	2390	3930	ND	1450
Selenium	ug/l	5.0E+01	5.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	ug/l			5570	175000	12400	24200	88100	32300	18900	20000	35800	7640	9740	8970	5570	14000	60100	20100	14000	14300	5410	16800
Thallium	ug/l	2.0E+00	2.0E+00	4.2	ND	ND	ND	ND	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ug/l			0.6	1.2	ND	1.3	ND	1.8	ND	ND	0.7	ND	1.3	1.6	1	ND	ND	0.9	2.1	14.3	ND	0.9
Zinc	ug/l			ND	390	136	ND	6310	ND	ND	ND	615	1350	ND	ND	ND	319	4590	ND	ND	ND	ND	ND
Cyanide	ug/l	2.0E+02	2.0E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
1. RIDEM = Rhode Island Department of Environmental Management. The standards listed are taken from "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases". The standards are from Table-3 - GA Groundwater Objectives.
2. USEPA MCL = United States Environmental Protection Agency Maximum Contamination Level.
3. Results colored red indicate an exceedance of a listed standard.

TABLE-1B
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS
Carroll Products Facility
Richmond, Rhode Island

Analyte	Units	Standards for Comparison		GZ-12		GZ-13	MW-1001	MW-1005	Site well
		RIDEM [1]	USEPA						
		GA/GAA	MCL	11/20/1996	1/21/96BD	11/25/1996	11/19/1996	11/20/1996	12/20/1994
Aluminum	ug/l			ND	ND	ND	127	237	26.6
Antimony	ug/l	6.0E+00	6.0E+00	ND	ND	ND	ND	ND	ND
Arsenic	ug/l		5.0E+01	ND	ND	ND	ND	ND	ND
Barium	ug/l	2.0E+03	2.0E+03	77.3	76	51.8	ND	ND	6.7
Berylium	ug/l	4.0E+00	4.0E+00	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	5.0E+00	5.0E+00	ND	ND	ND	ND	ND	ND
Calcium	ug/l			22400	20900	36800	2180	10100	2590
Chromium	ug/l	1.0E+02	1.0E+02	1.9	0.58	1.8	ND	ND	ND
Cobalt	ug/l			1.4	1.6	1.8	ND	ND	ND
Copper	ug/l		1.3E+03	ND	ND	ND	ND	ND	12.9
Iron	ug/l			5690	7830	26800	ND	11000	3170
Lead	ug/l	1.5E+01	1.5E+01	ND	ND	ND	ND	55.2	ND
Magnesium	ug/l			1600	1510	1420	761	1460	887
Manganese	ug/l			1100	1410	2750	144	655	377
Mercury	ug/l	2.0E+00	2.0E+00	ND	ND	ND	ND	ND	ND
Nickel	ug/l	1.0E+02	1.0E+02	ND	ND	ND	ND	ND	ND
Potassium	ug/l			3570	2530	1300	ND	ND	611
Selenium	ug/l	5.0E+01	5.0E+00	ND	ND	ND	ND	ND	ND
Silver	ug/l			ND	ND	ND	ND	ND	ND
Sodium	ug/l			18000	18300	23200	ND	10500	4930
Thallium	ug/l	2.0E+00	2.0E+00	ND	3.2	5	ND	ND	ND
Vanadium	ug/l			2.9	1	1.3	ND	ND	ND
Zinc	ug/l			ND	ND	ND	ND	453	16.1
Cyanide	ug/l	2.0E+02	2.0E+02	ND	ND	ND	ND	ND	ND

Notes:
1. RIDEM = Rhode Island Department of Environmental Management. T
and Remediation of Hazardous Material Releases". The standards are
2. USEPA MCL = United States Environmental Protection Agency Maxim
3. Results colored red indicate an exceedance of a listed standard.

TABLE-1C
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Carroll Products Facility
Richmond, Rhode Island

Analyte	Units	Standards for Comparison		PHASE IIA/IIB RFI DATA																			
		RIDEM [1]	USEPA	GZ93-1			GZ93-2		GZ93-3		GZ93-4		GZ93-5		GZ93-6		GZ93-7		GZ93-8		GZ93-10		GZ93-11	
		GA/GAA	MCL	10/28/1993	10/28/93 BD	12/19/1994	10/28/1993	12/19/1994	10/28/1993	12/21/1994	10/28/1993	12/20/1994	10/28/1993	12/21/1994	10/29/1993	12/21/1994	10/29/1993	12/22/1994	11/3/1993	12/22/1994	10/29/1993	12/21/1994	11/3/1993	12/21/1994
Aluminum	ug/l			757	721	439	268	468	ND	55.3	ND	55.6	ND	181	ND	25.2	466	815	ND	ND	ND	ND	ND	ND
Antimony	ug/l	6.0E+00	6.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/l		5.0E+01	5.9	5.4	ND	4.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.5	4.8	3.6	ND	ND	ND	ND	4.6
Barium	ug/l	2.0E+03	2.0E+03	85.6	82.2	20.7	58.7	60.8	ND	14.7	25.6	18.6	ND	125	25.9	26.4	30.3	39.9	70.7	34.9	65	32.1	68	104
Beryllium	ug/l	4.0E+00	4.0E+00	1	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	5.0E+00	5.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	ug/l			4290	4180	3380	2440	2930	2420	2480	6730	5690	10700	11000	114000	40100	1550	1660	43100	66300	10100	12100	7190	7660
Chromium	ug/l	1.0E+02	1.0E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	7.8	48.8	41.4
Cobalt	ug/l			ND	ND	ND	ND	ND	ND	ND	5.2	4.4	11.2	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	ND
Copper	ug/l		1.3E+03	ND	ND	ND	ND	ND	ND	ND	9	ND	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	ug/l			ND	ND	17	ND	31.4	ND	39	12000	15100	29700	9960	13300	3810	ND	41.6	14500	27000	3180	14300	4040	7510
Lead	ug/l	1.5E+01	1.5E+01	ND	1.9	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND
Magnesium	ug/l			817	802	685	696	979	601	653	986	1030	3690	1770	754	543	564	573	705	1020	821	1080	1030	873
Manganese	ug/l			78.7	79.9	53.3	161	129	118	158	1310	902	999	428	132	148	125	135	1540	363	1250	880	655	681
Mercury	ug/l	2.0E+00	2.0E+00	ND	ND	0.27	ND	0.14	ND	ND	ND	ND	ND	ND	ND	0.17	ND	0.18	ND	ND	1.4	ND	ND	ND
Nickel	ug/l	1.0E+02	1.0E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	ug/l			712	729	634	1500	1120	706	548	2210	2360	3990	2480	1550	1060	659	852	1810	1510	3010	3010	5460	4330
Selenium	ug/l	5.0E+01	5.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l			ND	ND	ND	ND	ND	ND	4.2	ND	ND	ND	4.6	ND	ND	ND	ND	ND	4	ND	6.2	ND	4.4
Sodium	ug/l			28700	27100	31500	13200	17900	10800	8060	11900	19800	39800	26000	11400	22700	3690	10200	18300	17400	19500	20500	34700	32300
Thallium	ug/l	2.0E+00	2.0E+00	ND	ND	ND	ND	ND	ND	3.4	ND	ND	ND	8.4	ND	7.8	ND	4.6	ND	9.7	ND	7.2	ND	6
Vanadium	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND
Zinc	ug/l			69.8	64.8	8.4	84.1	63.8	63.7	52.2	ND	ND	7720	16700	ND	99.1	ND	10.2	84.3	6.2	ND	80.6	10.6	ND

TABLE-1C
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Carroll Products Facility
Richmond, Rhode Island

Analyte	Units	Standards for Comparison		PHASE IIA/IIB RFI DATA															
		RIDEM [1]	USEPA	GZ93-12		GZ93-13				GZ93-14		GZ93-15		GZ93-16		GZ93-17			Site well
		GA/GAA	MCL	10/29/1993	12/22/1994	11/1/1993	11/1/93 BD	12/19/1994	12/19/94 BD	11/1/1993	12/20/1994	11/1/1993	12/20/1994	11/1/1993	12/20/1994	11/1/1993	12/20/1994	12/19/1994	12/20/1994
Aluminum	ug/l			ND	228	ND	ND	7420	7140	ND	ND	ND	32.6	ND	296	ND	163	186	14.1
Antimony	ug/l	6.0E+00	6.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/l		5.0E+01	ND	2.5	ND	ND	11.1	11.3	3.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ug/l	2.0E+03	2.0E+03	76.6	98.2	ND	ND	31.6	31	39.4	24.3	44.1	35.3	ND	21.7	ND	22.6	13.5	6.7
Berylium	ug/l	4.0E+00	4.0E+00	ND	ND	ND	ND	3.8	3.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	5.0E+00	5.0E+00	ND	ND	ND	ND	27.7	26.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	ug/l			5540	4130	9270	9410	69700	69900	3280	5660	1810	1860	2390	4260	ND	1640	7860	2050
Chromium	ug/l	1.0E+02	1.0E+02	ND		8.9	ND	6.9	6.9	ND	ND	8.7	ND	ND	ND	ND	ND	ND	ND
Cobalt	ug/l			3.2	ND	4.3	4.3	99.4	98.3	7.8	ND	ND	ND	7.4	29.9	10.9	88.2	ND	ND
Copper	ug/l		1.3E+03	ND	ND	ND	ND	19.2	18.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	ug/l			15100	3060	4480	4750	19400	19500	9400	3770	5640	2080	6810	9050	ND	320	1270	2310
Lead	ug/l	1.5E+01	1.5E+01	ND	ND	ND	ND	58.2	55.6	ND	ND	ND	ND	ND	ND	ND	ND	3.6	ND
Magnesium	ug/l			593	464	462	503	1920	1900	488	835	708	694	552	758	672	160	981	707
Manganese	ug/l			289	92.6	1040	1100	3020	3000	1400	1610	446	370	583	697	23.3	39.6	38.6	303
Mercury	ug/l	2.0E+00	2.0E+00	ND	ND	0.23	ND	ND	ND	ND	ND	ND	0.13	0.21	ND	ND	ND	ND	ND
Nickel	ug/l	1.0E+02	1.0E+02	ND	ND	ND	ND	49.7	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.1
Potassium	ug/l			1450	1220	3350	3650	3200	3120	1750	2040	284	504	648	944	212	699	1520	524
Selenium	ug/l	5.0E+01	5.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.3	ND	4.8	ND	ND
Sodium	ug/l			108000	64200	8720	9520	13700	13300	9720	12900	7720	5900	15000	11900	16200	8770	9870	4250
Thallium	ug/l	2.0E+00	2.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/l			ND	783	1690	1730	64700	65300	1220	ND	36.2	ND	142	3170	941	3100	414	10.1

TABLE-1D

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - PCBs/PESTICIDES

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	Standards for Comparison			PHASE IIA/IIB DATA																			
		RIDEM[1]	USEPA	REG. III	GZ93-1			GZ93-2	GZ93-4		GZ93-6	GZ93-7		GZ93-8			GZ93-9	GZ93-13			GZ93-14	GZ93-15	GZ93-16	
		GAA	MCL	TAP WATER	10/28/1993	10/28/93BD	11/19/1996	10/28/1993	10/28/1993	11/18/1996	10/29/1993	10/29/1993	11/18/1996	11/3/1993	11/21/1996	11/21/1996	10/29/1993	11/1/1993	11/1/93BD	11/21/1996	11/1/1993	11/1/1993	11/1/1993	11/19/1996
alpha-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
beta-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
delta-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	ug/l		4.0E-01	2.3E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	ug/l			4.0E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hepatachlor epoxide	ug/l		2.0E-01	9.1E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ug/l			4.2E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDE	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	ug/l		2.0E+00	1.1E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDD	ug/l			1.4E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDT	ug/l			1.0E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	ug/l		4.0E+01	1.8E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-Chlordane	ug/l		2.0E+00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-Chlordane	ug/l		2.0E+00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	ug/l		3.0E+00	6.1E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1016	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1221	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1232	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1242	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1248	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

1. RIDEM = Rhode Island Department of Environmental Management. The standards listed are taken from "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases". The standards are from Table-3 - GA Groundwater Objectives.
2. USEPA MCL = United States Environmental Protection Agency Maximum Contamination Level.
3. Reg III Tap Water taken from EPA Region III Risk-Based Concentration Table (3/11/97), except for Methylnaphthalene, 4,4-DDD, and 4,4-DDT, which were taken from the groundwater standards of North Carolina

TABLE-1D

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - PCBs/PESTICIDES

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	Standards for Comparison			PHASE IIA/IIB DATA								
		RIDEM[1]	USEPA	REG. III	GZ93-17	GZ96-19	GZ96-21	GZ96-23	GZ-12		GZ-13	MW-1001	Site Well
		GAA	MCL	TAP WATER	11/1/1993	11/20/1996	11/21/1996	11/20/1996	11/20/1996	11/21/96BD	11/25/1996	11/19/1996	4/11/1995
alpha-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
beta-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
delta-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	ug/l		4.0E-01	2.3E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	ug/l			4.0E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hepatachlor epoxide	ug/l		2.0E-01	9.1E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ug/l			4.2E-03	ND	ND	ND	ND	ND	ND	ND	0.041	ND
4,4-DDE	ug/l				ND	ND	ND	ND	ND	ND	ND	0.024	ND
Endrin	ug/l		2.0E+00	1.1E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDD	ug/l			1.4E-01	ND	ND	ND	0.029	ND	ND	ND	0.38	ND
Endosulfan sulfate	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4-DDT	ug/l			1.0E-01	ND	ND	ND	ND	ND	ND	ND	0.019	ND
Methoxychlor	ug/l		4.0E+01	1.8E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ug/l				ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-Chlordane	ug/l		2.0E+00		ND	ND	ND	ND	ND	ND	ND	0.054	ND
gamma-Chlordane	ug/l		2.0E+00		ND	ND	ND	ND	ND	ND	ND	0.042	ND
Toxaphene	ug/l		3.0E+00	6.1E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1016	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1221	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1232	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1242	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1248	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260	ug/l	5.0E-01	5.0E-01		ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

1. RIDEM = Rhode Island Department of Environmental Management. The standards and Remediation of Hazardous Material Releases". The standards are from Table-3
2. USEPA MCL = United States Environmental Protection Agency Maximum Contamin
3. Reg III Tap Water taken from EPA Region III Risk-Based Concentration Table (3/11/

TABLE-1E

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - WET CHEMISTRY AND FIELD SCREENING

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	USEPA MCL	GZ93-1				GZ93-2			GZ93-3			GZ93-4			GZ93-5		GZ93-5
			10/28/1993	10/28/93 BD	12/19/1994	11/19/1996	10/28/1993	12/20/1994	11/18/1996	10/28/1993	12/21/1994	11/18/1996	10/28/1993	12/20/1994	11/18/1996	10/28/1993	12/21/1994	11/21/1996
Wet Chemistry:																		
Alkalinity	mg/l		2.5	2.5		ND	7		35	11		ND						
COD	mg/l		5.3	5.9		6	23.2		16	ND		6						
Hardness	mg/l		15.1	18.1		4.7	44.4		14	23.8		11						
Nitrate (as N)	mg/l	10	0.21	0.27		0.06	1.2		11	0.88		1.2						
Nitrite (as N)	mg/l	1	ND	ND		0.6	ND		0.008	ND		ND						
Sulfate	mg/l	250	26.4	15.6		Q	6.4		17	11.5		12						
Total Kiebahl N	mg/l		0.36	0.52		0.2	1.17		1.8	0.09		0.2						
Total Solids	mg/l		1810	1500			9430			2660								
Total Susp. Solids	mg/l		7630	1460	ND	ND	9200		ND	2010		ND						
Total Dissolved Solids	mg/l	500	84	94	ND	ND	42		560	34		100						
Total Organic Carbon	mg/l		4	3.6	ND	ND	2.4		6.09	8.2		ND						
Field Screening																		
pH	SU		6		5.2	7.17	5.5	5.5	5.55	6.22	7.1	5.12	6.4	6.7	6.36	6.24	[illegible]2	5.59
Conductivity	uS/cm		190		220	0.58	110	170	219	100	60	0.113	190	190	0.372	510	[illegible]00	0.774
Temperature	ug/l		15.9		10.3		15	10.5	13.1	16.1	12.6	12.2	16.9	12.2	12.3	15.2	[illegible]3.6	13
Turbidity	NTU		730		0.5		200	0.9	3	175	<0.5	1	>1000	4	42	900	2	2
Dissolved Oxygen	ug/l		10.5		7.7	7.88	66	4.5	5.35	6.5	5.1	1.33	1.8	7.9	0.32	1.9	5	1.09

TABLE-1E

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - WET CHEMISTRY AND FIELD SCREENING

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	USEPA MCL	GZ93-6		GZ93-7			GZ93-8				GZ93-10		GZ93-11		GZ93-12		
			10/29/1993	12/21/1994	10/29/1993	12/22/1994	11/18/1996	11/3/1993	12/22/1994	11/21/1996	1/21/1996 B	10/29/1993	12/21/1994	11/3/1993	12/21/1994	10/29/1993	12/22/1994	11/19/1996
Wet Chemistry:																		
Alkalinity	mg/l							182		34	28	219				38		ND
COD	mg/l							158		17	16	263				201		9
Hardness	mg/l							234		200	210	63.7				28.7		9.8
Nitrate (as N)	mg/l	10						0.07		0.09	0.11	0.1				0.04		0.05
Nitrite (as N)	mg/l	1						ND		0.02	ND	ND				ND		ND
Sulfate	mg/l	250						129		22	250	37.8				30.3		12
Total Kiebahl N	mg/l							7.91		1.4	1.7	11.8				3.102		0.3
Total Solids	mg/l							16000				3760				4790		
Total Susp. Solids	mg/l							14200		470	460	3760				4250		160
Total Dissolved Solids	mg/l	500						186		2	15	98				364		ND
Total Organic Carbon	mg/l							40		2.7	2.8	252				55.1		1.26
Field Screening																		
pH	SU		6.31	5.6	5.4	4.9	4.58	6.84	6.6	6.31		6.77	7.6	7.16	7.1	6.37	4	5.2
Conductivity	uS/cm		670	320	300	90	0.282	380	470	0.711		180	290	560	470	830	60	0.238
Temperature	ug/l		14.7	12.8	20.3	13.8	14.2	15.2	11.5	11.4		16.9	12.3	15.2	15.2	16.3	1	11.3
Turbidity	NTU		95	2.5	700	0.5	0		3.5	3		>1000	4		1	>1000	2	18
Dissolved Oxygen	ug/l		0.5	3.7	9.4	14.2	7.46	0.8	5.5	1.02		1.4	1.9	2.4	1.9	0.8	2	1.16

TABLE-1E

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - WET CHEMISTRY AND FIELD SCREENING

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	USEPA MCL	GZ93-13				GZ93-14			GZ93-15			GZ93-16			GZ93-17		
			11/1/1993	11/1/93 BD	12/19/1994	11/21/1996	11/1/1993	12/20/1994	11/19/1996	11/1/1993	12/20/1994	11/19/1996	11/1/1993	12/20/1994	11/19/1996	11/1/1993	12/20/1994	11/25/1996
Wet Chemistry:																		
Alkalinity	mg/l			13		41							2		42	ND		ND
COD	mg/l			83.9		25							221		15	108		ND
Hardness	mg/l			58.6		56							44.9		9.5	33.9		0.23
Nitrate (as N)	mg/l	10		0.03		0.05							0.07		ND	0.38		ND
Nitrite (as N)	mg/l	1		0.01		ND							0.01		ND	ND		ND
Sulfate	mg/l	250		67.5		81							50.3		13	28.6		25
Total Kiebahl N	mg/l			5.56		5.4							6.01		1	2.63		0.4
Total Solids	mg/l			1070									1570		100	1150		
Total Susp. Solids	mg/l			722		200							1570		9.4	1220		58
Total Dissolved Solids	mg/l	500		57		ND							41		ND	ND		ND
Total Organic Carbon	mg/l			8.1		7.5							31.7		4.31	10.6		1.6
Field Screening																		
pH	SU		6.43		4.3	5.8	6.2	6.2	6.11	6.25	6.3	5.37	5.9	5.3	5.85	5.33	5.9	5.28
Conductivity	uS/cm		160		680	0.336	190	170	0.103	90	70	0.88	200	180	0.106	130	1	0.096
Temperature	ug/l		12.7		10	11.7	13.5	8.9	11.4	14	9.8	12	13.2	7.8	10.2	13.6	1	9.6
Turbidity	NTU		55		1.5	2	1	1	0	17	1	1	65	2	1	400	1	4
Dissolved Oxygen	ug/l		6.4		4.3	0.61	4.5	4.7	2.25	4.8	4.3	1.34	4.6	4.7	1.21	10.6	8.6	1.05

TABLE-1E

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - WET CHEMISTRY AND FIELD SCREENING

Carroll Products Facility

Richmond, Rhode Island

Analyte	Units	USEPA MCL	GZ96-19	GZ96-20	GZ96-21	GZ96-22	GZ96-23	GZ-11	GZ-12		GZ-13	MW-1001	MW-1005	MW-1005	Site well
			11/20/1996	11/20/1996	11/21/1996	11/25/1996	11/20/1996	11/20/1996	11/20/1996	11/21/96BD	11/25/1996	11/19/1996	11/1/1993	11/20/1996	12/20/1994
Wet Chemistry:															
Alkalinity	mg/l		45		2.2		ND		22	21			15.5	20	
COD	mg/l		36		23		7		7	10	ND		16.1	13	
Hardness	mg/l		61		13		13		62	59	8.6		16.3	31	
Nitrate (as N)	mg/l	10	6.2		ND		ND		0.16	0.23			0.96	0.96	
Nitrite (as N)	mg/l	1	0.02		ND		0.007		ND	ND			0.01	0.005	
Sulfate	mg/l	250	110		10		11		64	62			9.9	33	
Total Kiebahl N	mg/l		3.9		1.1		1.5		1	0.8	0.3		0.31	2	
Total Solids	mg/l												143		
Total Susp. Solids	mg/l		390		120		71		220	230			63	206	
Total Dissolved Solids	mg/l	500	230		ND		ND		ND	ND			17	ND	
Total Organic Carbon	mg/l		13		5.35		2.8		1.22	1.6			2.4	2.8	
Field Screening															
pH	SU			7.03	6.58	6.3	6.42	5.24	5.73		6.49	5.2	6.9	5.61	6.5
Conductivity	uS/cm			0.136	0.12	0.162	0.105	0.133	318		0.449	570	30	0.197	50
Temperature	ug/l			10.8	11.2	10.8	11	12.1	11.8		11.7	10	12.6	11	9.1
Turbidity	NTU			23	13	1	3	29	0		2	0.5	50	1	20
Dissolved Oxygen	ug/l			0.84	0.27	0.83	0.9	0.8	0.92		0.85	4.3	10.8	0.71	