

**Sakonnet River Bridge
Rehabilitation or Replacement Project**

**DRAFT ENVIRONMENTAL
IMPACT STATEMENT
& SECTION 4(f) STATEMENT**

Volume IIb

**DRAFT Preliminary Site
Investigation Report**

**DRAFT Preliminary Site Investigation
Report
Sakonnet River Bridge – Route 24/Route
138 and
Sakonnet River Bridge - EIS
Tiverton, Rhode Island**

Submitted to:
Commonwealth Engineers & Consultants, Inc.

Prepared by:
Rizzo Associates, Inc.

May 31, 2001

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Mr. Charles McKinley
Commonwealth Engineers & Consultants, Inc.
400 Smith Street
Providence, Rhode Island 02908

**Re: DRAFT Preliminary Site Investigation
Sakonnet River Bridge – Route 24/Route 138 and
Sakonnet River Bridge - EIS
Tiverton, Rhode Island**

Dear Mr. McKinley:

Rizzo Associates, Inc. is pleased to submit this report summarizing the results of Preliminary Site Investigations (PSIs) for property located in the vicinity of the Sakonnet River Bridge in Portsmouth and Tiverton, Rhode Island (the Site). This investigation was intended to further investigate areas recommended in the Initial Site Assessments (ISA) completed by Rizzo Associates in December of 1999 and May of 2000. The ISAs included a review of the Site Area history, a Site Area reconnaissance visit and a review of regulatory files pertaining to the Site Area (Figure 1). Because of the limited number of soil borings installed in the area east of the bridge, designated for the Route 24/Route 138 PSI, it was decided to prepare a single report dealing with both of the referenced areas, rather than individual reports for each area.

To assess soil conditions at the Site, twenty-eight soil borings were installed in areas beneath the bridge, along Riverside Drive and in potential bridge construction areas. One soil sample from each boring was submitted for laboratory analysis after being screened for total VOCs using a PID. This report consists of a summary that presents a narrative of the findings, recommendations and remedial alternatives.

We appreciate the opportunity to provide these services. Please contact the undersigned if you have any questions regarding this project.

Very truly yours,

Raymond C. Johnson, P.G.
Senior Vice President

Marisa A. Desautel
Environmental Scientist

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1.0 Site Investigation Scope

Rizzo Associates, Inc. conducted two Preliminary Site Investigations (PSIs) in relation to the planned reconstruction of the Route 24/Route 138 ramps and interchange, and for the preparation of an Environmental Impact Statement for proposed improvements to the Sakonnet River Bridge. This report was prepared following the State of Rhode Island Department of Environmental Management Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases (DEM-DSR-01-93 as amended August 1996). The objective of the investigations was to assess soil conditions in areas designated in two Initial Site Assessments (ISAs) completed by Rizzo Associates, Inc. in December of 1999 and May of 2000. Although separate authorizations were provided for the work associated with the Route 24/Route 138 ramps and interchange, and for the Sakonnet River Bridge, property access issues limited the number of borings that could be installed in the ramp/intersection reconstruction area. In addition, field examination of road cuts adjacent to several other proposed boring locations indicated that bedrock was present within approximately six inches to one foot below the ground surface and that the installation of borings at those locations was not warranted. The objective of the testing discussed in this report is to render an opinion as to whether soils in the Site Area indicate evidence of releases of oil and hazardous materials related to current or historic land uses in these areas.

As discussed in the ISAs prepared for each of the two areas discussed above, Rizzo Associates recommended the installation of soil borings and the collection and laboratory analysis of soil samples to assess subsurface conditions. The specific areas of concern that were identified in those reports include former underground storage tanks (USTs) located at properties on Main Road, the area of former gasoline tanks on Riverside Drive, properties listed as Resource Conservation and Recovery Act (RCRA) small quantity generators (SQGs), and the current and historical presence of roadways and railroad lines in the project areas. Soil borings located based on these potential release areas were installed in areas where soil excavation may occur during construction activities.

Rizzo Associates observed the advancement of twenty-eight (28) soil borings in areas beneath the bridge, along Riverside Drive and in potential bridge construction areas. The general locations in which borings were installed are shown on Figure 2, and specific boring locations are illustrated on Figure 3. Soil borings were advanced using a direct-push

type drilling machine with soil samples collected continuously for visual characterization and field screening for the presence of headspace volatile organic compounds (VOCs) using a photoionization detector (PID). Based on visual observation and PID screening results, one soil sample from each boring was selected for submission for laboratory analysis. The results of the soil sampling and analysis are discussed in Section 3.0 of this report. This report is subject to the Limitations in Appendix A.

Site Background

Initial Site Assessments (ISAs) were completed by Rizzo Associates for the Sakonnet River Bridge and Route 24/Route 138 ramps were completed in December 1999 and May 2000, respectively. The ISAs included a review of the Site history, a Site reconnaissance visit, and a review of regulatory files pertaining to the Site and surrounding areas (Figure 1).

The Sakonnet River Bridge ISA, completed on December 14, 1999, identified the following evidence of recognized environmental conditions or issues within the Site Area:

- Two properties in Tiverton are listed as Resource Conservation and Recovery Act (RCRA) small quantity generators (SQGs) – the Sakonnet Veterinary Hospital at 1320 Main Road and the property at 1334 Main Road. The Tiverton Yacht Club is listed as an Emergency Response Notification System (ERNS) property. Several underground storage tanks (USTs) were identified within the Tiverton Site Area, one of which was listed in 1994 as a leaking underground storage tank (LUST).
- Historical maps show the presence of gasoline tanks at several properties within the Tiverton Site Area. In 1920, two gasoline tanks were located on Depot Road just south of the former railroad station (currently Riverside Drive). The map dated 1933 indicated only one tank in that area, while a filling station had been constructed containing one gasoline tank on Main Road near Evans Avenue (currently the veterinary clinic at 1320 Main Road). In 1947, a filling station with at least two gasoline tanks was located at 220 Main Road (currently 1285 Main Road), north of Evans Avenue.
- Historical research indicates the presence of railroad tracks and roadways in the Site Area since the late 1800s. Because of the operation and maintenance of the roadways, especially along Route

24/138 there is the potential for soil contamination. Contamination along the roadside could include metals and PAHs. Possible contaminants along the railroad may include PAHs, metals, total petroleum hydrocarbons, and herbicides attributable to railroad maintenance operations.

The Route 24/Route 138 ramps ISA, completed on May 17, 2000, identified the following evidence of recognized environmental conditions or issues within the Site Area:

- The property at 1215 Main Road, currently occupied by Sakonnet River Manor, was listed by the regulatory database reviewed as possessing USTs, one of which was listed in 1994 as a LUST. Closure records on file at the Rhode Island Department of Environmental Management (DEM) document the removal of three USTs in December 1994. Soil was removed and stockpiled from an area of observed soil staining on the north end of a tank. Soil samples collected from this area did detect high levels of total petroleum hydrocarbons (TPH).
- A 1947 Sanborn map shows a filling station with at least two gasoline tanks located at 220 Main Road (currently 1285 Main Road), north of Evans Avenue. These gasoline tanks were not noted in the 1963 Sanborn map. What appeared to be a tank pad was observed in front of the building during the Site visit.

2.0 General Characterization

The proposed location of the Site is located approximately 150 to 180 feet (46 to 55 meters) above the National Geodetic Vertical Datum (NGVD). The ramp approaching the bridge from the east is located ten feet to 140 feet (three to 43 meters) above NGVD at the base of the bridge. The ramp approaching the bridge from the west is located ten feet (three meters) above NGVD extending from the base of the bridge to the Route 24 and Route 138 exit ramps.

The direction of groundwater flow is unknown, but is expected to flow to the west toward the Sakonnet River on the eastside of the bridge, and east toward the River on the west side of the bridge.

The nearest surface water feature is the Sakonnet River. One hundred-year and five hundred-year floodplains extend 10 to 200 feet (three to 61 meters) inland along both sides of the Sakonnet River near the Site.

According to the Public Works Department in Portsmouth and Tiverton, all residential and business buildings in the Site area are serviced by municipal sewer and water. There are no known municipal water supply wells or potable water supplies in or abutting the Site.

There were no environmentally sensitive areas observed in the Site area as a result of the ISAs conducted by Rizzo Associates, with the exception of the Sakonnet River and wetland areas immediately adjacent to the River.

Exceptions to the DEM-DSR-01-93 (as amended August 1996)

Subsurface investigations implemented at the Site were limited to areas accessible by the GeoProbe drilling equipment. Therefore, some areas adjacent to the bridge and ramps could not be accessed because of steep slopes or poor access. In addition, at the request of Commonwealth Engineers and the RIDOT, we did not attempt to obtain access to any of the privately owned parcels of land originally recommended for subsurface investigations.

3.0 Subsurface Investigation

Soil Boring Advancement

The investigations associated with the PSI included the installation of twenty-eight soil borings and the collection and laboratory analysis of soil samples. The investigation was implemented in accordance with the scope of work described in Rizzo Associates' proposals to Commonwealth Engineers & Consultants, Inc. dated October 3, 2000 and February 28, 2001. The approximate boring locations are shown on Figure 3.

The borings were completed on March 22 and 23, and April 16, 2001. Soil borings were advanced by Soil Exploration Inc. (SoilEx) of Leominster, Massachusetts and were observed by Rizzo Associates, Inc. personnel. The soil borings were advanced by SoilEx using GeoProbe[®] direct-push drilling equipment, to a maximum depth of approximately 10 to 15 feet below the ground surface. Soil samples were collected continuously using

disposable plastic sampling tubes and screened for headspace total volatile organic compounds (VOCs) using a photoionization detector (PID) following the standard protocols presented in Appendix C. PID responses ranged from “not detect” to 2 parts per million (ppm).

One soil sample from each boring was submitted to Alpha Analytical Laboratories, Inc. of Westborough, Massachusetts for analysis for: Toxicity Characteristic Leaching Procedure (TCLP) lead, polynuclear aromatic hydrocarbons (PAHs), pesticides/herbicides by EPA Method 8081, and thirteen Priority Pollutant metals (PP 13 metals). Three of the twenty-eight samples were submitted for additional analyses based on filed observations and PID headspace readings. The additional analyses included total petroleum hydrocarbons (TPH) by EPA Method 8100M, volatile organic compounds (VOCs) by EPA Method 8260, RCRA 8 Metals, polychlorinated biphenyls (PCBs) and flash point. The results of the laboratory analyses are included as Appendix D and are presented in Table 1 of this report.

The locations at which soil borings were installed are shown on Figure 3 of this report. Borings B-1 through B-6 were completed on the northeast side of the bridge in Tiverton, including area under the bridge and ramps. Borings B-7 through B-11 were completed to the south of B-1 through B-6, adjacent to Tucker Avenue, including area beneath the bridge. Borings B-12 through B-16 were advanced in area beneath the bridge on top of a hill, adjacent to Riverside Drive to the east. Borings B-17 through B-20 were completed on the southwestern side of the bridge in Portsmouth, including area beneath the bridge and ramps. Borings B-21 through B-28 were advanced along the railroad tracks north of Route 24/138 in Portsmouth.

Proposed areas for soil borings located along Route 24/138 in Tiverton and Portsmouth were inaccessible due to jersey barriers placed in that area because of ongoing construction activities, and a steep slope along both sides of the highway.

Bedrock was encountered in the area of borings B-1 through B-11 at depths of 5.5 to 11.5 feet below ground surface. According to the Bedrock Geology map of Rhode Island, bedrock in the Site area is expected to be the Rhode Island Formation, consisting of sandstone, graywacke, shale, and conglomerate.

Soils observed in the borings consisted of light brown to dark brown medium to coarse sand with clay, trace silt and orange-red mottles.

Cobbles and gravel were present in almost all of the samples. When encountered, the depth to groundwater was approximately 2.5 to 6 feet below the ground surface.

4.0 Results of Laboratory Analysis

This section summarizes the laboratory analysis results for the soil samples collected during this investigation. The laboratory certificates of analysis are presented as Appendix D and the positive analytical results are tabulated in Table 1. In the table, the laboratory analytical results are compared to the applicable Direct Exposure Criteria and GA Method 1 Leachability Criteria established by the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (DEM-DSR-01-93 as amended August 1996).

Because residential dwellings and residentially zoned property are located within 500 feet of the Site Area, Site soils are classified Residential Method 1 Direct Exposure Criteria pursuant to the DEM-DSR-07-03 as amended August 1996, Rule 8.02.A subpart i.

As noted above, twenty-eight soil samples were submitted for laboratory analysis for TCLP lead, PAHs, pesticides/herbicides and PP 13 metals. Of the twenty-eight samples, samples from three borings were submitted for additional analysis based on PID headspace readings and olfactory observations made during field activities. Specifically, soil samples B-10, B-14 and B-16 were submitted for analysis for TPH, VOCs, RCRA 8 Metals, PCBs and flash point.

The analysis results for the soil samples indicated no detectable levels of TCLP lead, pesticides/herbicides, PAHs, TPH, or VOCs. Low concentrations of metals were detected in the samples, but at levels believed to be indicative of background conditions. Detectable levels of arsenic were reported in all of the samples. With the exception of two borings, B-2 and B-5, all of the samples contained arsenic at concentrations equal to or greater than the Residential Direct Exposure Criteria of 1.7 milligrams per kilogram (mg/kg). No other compounds were detected at concentrations above the Residential Direct Exposure Criteria.

5.0 Summary and Conclusions

The Site area is mostly residential with some industrial properties located in Tiverton, along the Sakonnet River south of the bridge. This area has historically been a fishing port and industrial area since at least 1911. Light industry and commercial buildings previously occupied portions of the Site and surrounding area. The major area of commercial and industrial buildings during the early-to mid-1900s had been along Riverside Drive, formerly known as Depot Road, near the railroad bridge. This area, including a pier, has been occupied by fishing companies, a fertilizer company, a boat yard, a machine shop, and a storage company. Other commercial and industrial buildings previously located in the Site area include freight houses, a railroad station at the intersection of Depot Road (currently Riverside Drive) and Evans Avenue, and a garage and automotive repair shop.

To assess the current soil conditions in the Site Area, Rizzo Associates recommended the installation of soil borings in the area of former gasoline tanks on Riverside Drive and Main Road and collection of soil samples along Route 24/138, ramps and railroad tracks and in areas proposed for excavation. This Preliminary Investigation included the installation of twenty-eight soil borings in the areas noted above, and the collection and laboratory analysis of one soil sample from each boring. Because of access limitations soil borings could not be installed in all of the locations indicated in the proposals submitted for this work.

Because residential dwellings and residentially zoned property are located within 500 feet of the Site Area, Site soils are classified Residential Method 1 Direct Exposure Criteria pursuant to the DEM-DSR-07-03 as amended August 1996, Rule 8.02.A subpart i.

According to the Public Works Department in Portsmouth and Tiverton, all residential and business buildings in the Site area are serviced by municipal sewer and water. There are no known municipal water supply wells or potable water supplies in the Site Area or abutting the Site Area.

The soil sampling and analysis performed as part of this investigation identified the following conditions:

- The twenty-eight soil samples were all reported to contain arsenic at concentrations ranging from 1.3 to 7.0 mg/kg. With the exception of B-2 and B-5, all of the samples contained arsenic at concentrations that

exceed the Residential Direct Exposure Criteria of 1.7 mg/kg. For reference, the Industrial/Commercial Direct Exposure Criteria for arsenic is 3.8 mg/kg. The laboratory results did not yield elevated concentrations of any other analyzed constituents.

Development of Remedial Alternatives

In accordance with the State of Rhode Island Department of Environmental Management (RIDEM) Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases (DEM-DSR-01-93 as amended August 1996), if arsenic is present in soil samples at concentrations above 1.7 mg/kg the responsible party must notify the RIDEM within 15 days after receiving knowledge of the release. As discussed below, although it is believed that the arsenic detected in the soil samples collected during this investigation is naturally occurring and not related to a release, the regulations require that RIDOT provide notification to RIDEM of these results.

Based on the history of the Site area, the range of arsenic concentrations detected in the samples collected during this investigation, and Office of Waste Management (OWM) guidance, it is believed that the arsenic detected in soil at the Site is naturally occurring, and not related to a release. In accordance with the OWM Policy Memo 00-01, *Guidance for Arsenic in Soil*, arsenic concentrations between 1.7 and 7.0 mg/kg may be determined to be background provided that an Environmental Professional can provide a certification justifying a background conditions conclusion.

Based on the results of the testing discussed in this report, the only condition that was identified which requires notification to the RIDEM is the arsenic in soil at concentrations above 1.7 mg/kg. Pursuant to DEM-DSR-01-93 as amended August 1996, and OWM Policy Memo 00-01, we recommend that a background certification be prepared for the detected arsenic concentrations and submitted to the RIDEM. Unless completion of that evaluation does not support the background certification, or RIDEM does not concur with the conclusion, remedial actions will not be required. Although soil conditions requiring specialized disposal requirements were not identified during this investigation, we recommend that soil stockpiled during construction for off-site disposal be characterized in accordance with applicable regulations for proper transport and disposal.

6.0 References

United States Geological Survey. Bedrock Geology Map of Rhode Island. 1987.

United States Geological Survey. Topographic map of Fall River, Massachusetts/Rhode Island, 1985.

Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, March 31, 1993 (DEM-DSR-01-93 as amended August 1996). State of Rhode Island and Providence Plantations, Department of Environmental Management, Division of Site Remediation.

Guidance for Arsenic in Soil, September 22, 2000 (OWM Policy Memo 00-01). State of Rhode Island and Providence Plantations, Department of Environmental Management, Office of Waste Management.

Initial Site Assessment, Sakonnet River Bridge Eastern Ramps Environmental Impact Statement, Tiverton, Rhode Island, May 17, 2000, Rizzo Associates, Inc.

Initial Site Assessment, Sakonnet River Bridge, Tiverton, Rhode Island, December 14, 1999, Rizzo Associates, Inc.