

January 27, 2003

Mr. Robert A. Young
Director of Engineering
Southern Union Company
New England Division
100 Weybossett Street
Providence, Rhode Island 02903

RE: Bay Street Neighborhood Study Area
Tiverton, Rhode Island
Case #2002-065 (a)

Dear Mr. Young:

Please find attached a copy of the Department of Environmental Management's comments concerning the Site Investigation Report (SIR) submitted by VHB, Inc. on October 31, 2003 concerning the Bay Street Neighborhood Study Area SIR and the five (5) additional SIR's submitted separately by VHB, Inc. on December 5, 2003 on behalf of Southern Union Company New England Gas Division.

Also, please find attached along with the abovementioned comments by the Department, a copy of comments received by the Department from the following legal counsel, agencies, consultants and private individuals:

1. Comments from the RI Department of Health dated and received December 30, 2003.
2. Comments from Rick Sugatte- USEPA Region 1 received January 23, 2004.
3. Comments from EA Engineering, Inc. on behalf of the Town of Tiverton received January 27, 2004.
4. Questions from Paul Revere III, Esq. on behalf of Shelia and Dennis Reis (20 Judson Street) dated and received November 5, 2003.

5. Additional comments from Paul Revere III Esq. on behalf of the Reis Family dated January 15, 2004 and received January 16, 2004.
6. Comments from John Thompson (Woodard & Curran) on behalf of Victoria and Gary Rose (34 Chase Avenue) dated December 30, 2003 and received January 2, 2004.
7. Comments from John Thompson (Woodard & Curran) on behalf of Mr. & Mrs. Corvello (188/190 Bay Street) dated December 30, 2003 and received January 2, 2004.
8. Comments from Gail Corvello, President of Environmental Neighborhood Awareness Committee of Tiverton (E.N.A.C.T.) dated January 2, 2004 and received January 6, 2004.

The Department requests that New England Gas Company (NEGC) respond to the Department in writing within 21 days of the date of this letter outlining its plans to address these comments and to conduct further investigation of Bay Street Neighborhood Study Area. The response should include a schedule of activities.

If you have any questions please contact me by telephone at (401) 222-2797 ext 7102.

Sincerely,

Jeffrey Crawford
Principal Environmental Scientist
Office of Waste Management

CC: Terrence Gray, Assistant Director
Leo Hellested, Chief Office of Waste Management
Kelly Owens, Supervising Engineer OWM
Richard Enander, RIDEM Customer & Technical Assistance
Robert Vanderslice, Chief RIDOH Risk Assessment
Claudette Linhares, Town Council President, Tiverton
Christopher Cotta, Town Manager, Town of Tiverton
Timothy O'Connor, VHB, Inc.
Gail Corvello, E.N.A.C.T.
Gary Kaufman, Ransom Environmental, Inc.
(Simpson Family members)
John Thompson, Woodard & Curran
(Corvello & Rose Family members)
Paul Revere III, Esq. (Reis Family)
Alicia Pina, The Providence Journal Company

RIDEM Comments

Bay Street Neighborhood Study Area

January 27, 2004

General Comments

1. The Site Investigation names "Bay Street Neighborhood Study Area" and the " Bay Street Suspected Fill Area" is synonymous for purposes of the comments listed below.
2. It was the Department's understanding from the beginning that this investigation was a limited investigation in scope and was focused primarily on specific properties agreed to by the Department and NEGC based solely upon the results of the EA Site Investigation performed in some of the neighborhood road areas. It was also the Department's understanding that the New England Gas Company (NEGC) would expand their investigation onto any abutting property where evidence of waste materials were discovered and confirmed by analytical testing. The Department was not of the understanding at the beginning of the investigation that NEGC was intending on eliminating properties or drawing final conclusions based solely upon this limited investigation. NEGC is reminded that the Department originally wanted to investigate the entire neighborhood including the vacant property to the south of Judson Street. At the time, NEGC indicated to the Department that it was reluctant to perform an initial investigation of that extent and preferred to start from the identified contamination (Judson & Bay Street) and in the public roadways and work outward by adding abutting properties to the investigation when contamination was detected.
3. The Department does not concur with New England Gas Company (NEGC) that the Site Investigation Report (SIR) is complete on some if not all of the properties that were investigated and remain to be investigated. The Department requests that the proposed second phase of investigation look more thoroughly (horizontal and vertical extent) at all of the properties. There appears to be sufficient data gaps through out the SIR that are outlined in the comments below.
4. The Department does not concur with NEGC that the nine properties identified by NEGC and carved out of this SIR are completely separate and distinguishable sites from this investigation due to historical ownership and commercial activities. There is evidence on all of the parcels that some of the Contaminants of Potential Concern (COPCs) may have originated from the Former Manufactured Gas Plant (FMGP). Therefore, the Department will not issue Letters of Responsibility to current or historical property owners or operators at this time. NEGC may prepare evidence for Department consideration regarding other viable Responsible Parties, for the COPCs which may have caused or

contributed to the property contamination.

5. The SIR format should follow and/or cross reference the Department's SIR checklist so as to be user friendly for the purpose of understanding the investigation that was performed. Readers should not constantly have to refer to the Appendices to seek answers to questions.
6. The SIR does not historically document anything about the nature and type of MGP facility, which was operated by Fall River Gas Co., and its location in relation to the Bay Street Neighborhood. That information and in conjunction with the reference document ("Management of Manufactured Gas Plant Sites") (Reference Document) cited by Environ on behalf of NEGC, would have assisted NEGC and VHB in scoping the SIR to search for all contaminants of potential concern which should have been investigated for in the soils and groundwater and would have been a key resource in gauging the nature of hazardous materials found at former manufactured gas plants. This reference document was a historical study of 33 former MGP facilities, including two that were located in Massachusetts.
7. The abovementioned reference document clearly identifies contaminants of potential concern (COPCs), ranges of COPCs that might be found in waste from a former MGP. The list includes Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Cyanide(s), Sulfides, Phenolics, and approximately 16 Inorganics + Metals including Arsenic, spent Oxides and Inorganic Nitrogen. The reference document also states that herbicides, pesticides and solvents must be considered when investigating and evaluating a MGP site. The reference document further includes the EPA Contract Laboratory Program (CLP) list with additional compounds from the RCRA perspective that may be in the range of COPCs.
8. Reference Document -Table 23-1 Characteristics of Pure Wastes found at MGP Sites identifies waste streams from MGP facilities. The identified waste streams seem very similar to what NEGC/VHB may have observed through out the study area during the Site Investigation. These descriptions include orange-brown wood chips, high iron staining, sulfur odor, blue or orange staining, gray or black coloration, clay, ash and glazed clinkers. How did NEGC/VHB make the determination that none of their observations, including but not limited to iron staining, orange mottling, or redoximorphic soils, were not evidence of non-weathered or weathered purifier waste. How did NEGC/VHB determine that the gray soils with dark coloration were not the ASH and Clinker waste stream?
9. Arsenic is a COPC with former MGP facilities and cannot be eliminated from the Site Investigation or Risk Assessment.
10. The SIR should have included historical information concerning the neighborhood, the surrounding area along with historical information as it relates to the former Fall River Gas Company and its past operations and waste material disposal practices. Does NEGC possess any information that disputes the allegation that the

contaminated material found in the Bay Street Neighborhood Study Area is from the former Fall River Gas Company facility. If so, please provide the documentation to the Department.

11. NEGC does not provide any evidence to support that high lead concentrations observed on some of the properties might have come from other lead sources such as lead paint. To the Department's knowledge the SIR did not have any soil sampling performed along the drip edges of older homes or visual evidence of lead paint chips to support any assumptions.
12. It is the Department's position that NEGC did not collect an adequate representation of samples from a majority of the 41 parcels where NEGC has proposed no further investigation. There is clearly evidence from observations noted by the field investigation personnel and from the soil sampling that fill material with COPCs are present in the soils through out a majority of the neighborhood.
13. The SIR includes low Photo Ionization Detections (PIDs) and visual evidence of waste materials on some of the properties that clearly indicates waste material being present throughout neighborhood. Boring logs identify evidence of dark colored soils, orange coloration, iron staining, gray colored soils, ash, coal and coal fragments, wood debris, low petroleum and chemicals odors, re-doximorphic soils and re-worked soils. How does NEGC believe that these observations are not at a minimum weathered waste material from the former MGP? (See Table 23 of the abovementioned reference document).
14. NEGC proposed to investigate four surface water-sampling locations, however, only two were obtained. Please explain. The Department's surface water sampling from three discharges west of Bay Street and the two locations that were sampled by VHB identified Barium along with fecal coliform. In the Environ reference document, Barium was a compound found at 6 of the 33 former MGPs.
15. Beryllium is a COPC at some MGP facilities as identified in the Environ reference document mentioned above and therefore should be included as a COPC at this site until the evidence indicates otherwise.
16. This SIR does not appear to have factored in COPCs identified in the public rights of way (EA investigations). Given that the suspected origin of this material is from the same former MGP operated by Fall River Gas Company, the locations and concentrations should have been considered in this SIR and any evaluation of risk. Comparison of the sample results and observations clearly identifies a suspected source area in the soil borings for the following locations: VHB samples 0306-1, 0308-SS-4, B4/MW4 in Judson Street and EA samples Judson 1, 2 & 3 also located in Judson Street. There is clear evidence of a suspected source area of contamination where observed waste materials with high concentrations of COPC's exist on the private properties and in the road area that further justifies investigation work on Lots 4, 6 and 8 and the adjacent road area.

17. NEGC states in the SIR that the Town records identify a "dump" between Judson, Hooper and Bay Street that is now occupied by twelve house lots. The observations in the property borings and the soils sampling results of the SIR clearly support that there was disposal of waste materials on a majority of these properties. All of these properties must be further investigated to fill data gaps and complete the SIR. Any evaluation of risk would need to consider these contaminants and their concentrations.
18. To achieve compliance with the Remediation Regulations, an Environmental Land Usage Restrictions (ELURs) is required on any property where exceedances of the Method 1 Criteria are proposed to be left on site and managed through engineering controls. The current property owner must record ELUR's.
19. NEGC has attempted to claim that on some of the lots, historical farming occurred and therefore the concentrations of some compounds detected are farming related. The SIR, however, contains no Pesticide or Herbicide testing to support this claim, and it is known that the COPC's present on site are also identified in waste from former MGPs.
20. After a review of the SIR sampling locations and site maps provided and Environs statement that the sampling locations were not selected randomly, there does appear to be some bias towards sample collection at or near property boundaries. Since the Departments definition of a "Site" does not recognize property boundaries, how did NEGC evaluate COPCs on one property where further investigation is proposed and COPCs on the abutting property where no further investigation is proposed? If a contaminated sample location is near the property line, it seems highly possible that contamination may also be on the adjacent parcels. The Department believes that these adjacent parcels would warrant further investigation.
21. Please explain why the raw data was not provided to the Department as part of the submission along with the results of the Matrix Spikes and Matrix Spike Duplicates and trip blanks.

SPECIFIC COMMENTS

[BLOCK 3]

22. NEGC identifies in the SIR that properties west of the Town Playground have soils that have been re-worked or graded causing a mixing. The field personnel noted that fill material present included slag, coal, ash and brick mixed in with the soil. Please explain how NEGC/VHB is defining re-worked or re-graded soils here and throughout the rest of the document. Please provide the suspected source of the slag, coal, ash, and brick present in this area.
23. NEGC has investigated 15 lots on Block 3. Four (4) lots (4,7,8,14) located west of the Town playground have been selected for

further investigation. Five additional lots (3,5,6,9,12) located west of the Town playground all had confirmed soil testing which identified PAHs and Inorganic Metals present in the property soils. Some of these lots also had confirmed PID readings as part of the soils screening. Please explain how NEGC justifies, with limited sampling, that no further investigation activities are warranted on these five lots when field observations and analytical testing indicate that fill on these properties may contain contaminants and/or byproducts from the former MGP facility.

24. NEGC investigated four (4) properties located East of the Town Playground. Three (3) of the properties (Lots 1,1A and 1C) had confirmed PAHs and Inorganic Compounds along with confirmed PID readings in the fill material, however, no further investigation is planned. Please explain how NEGC justifies no further investigation activities at these three lots when field observations and analytical testing indicate that fill on these properties may contain contaminants and/or byproducts (COPCs) from the former MGP facility.
25. Please explain why there was no 0-2 foot samples obtained from the deep boring locations.

[BLOCK 5]

26. NEGC has investigated only six (6) lots on Block 5. The SIR identifies Lots 11 and 18 as having observed suspected fill materials; however, NEGC only proposes to investigate Lot 18. Please explain how NEGC justifies no further investigation activities on Lot 11 when field observations and analytical testing indicate that fill on the properties may contain contaminants and/or byproducts (COPCs) from the former MGP facility.
27. Please explain why Lots 11A, 12, 16 and 19 are not proposed for further investigation given that they all had confirmed soil testing which identified PAHs and Inorganic Metals present in the property soils. In addition, Lots 11A and 16 had observed PID hits that coincided with the boring logs.
28. Please explain why there were a lack of soil samples obtained from Lots 11A, 12 and 18.
29. Please explain why no 0-6 inch samples were obtained on Lots 11,11A or 19.
30. The SIR states that Lots 12 and 16 contained re-worked soils, however, there were no observations on Lots 11A and 19. This statement seems inconsistent with the soil sampling results given that Lots 11A, 12, 16 and 19 have PAHs and Inorganic Metals confirmed present in the soils. Please explain how VHB is defining re-worked soils here and throughout the SIR document.
31. Please explain why there were no 0-2 foot samples obtained from the deep boring locations

[BLOCK 8]

32. Fourteen properties were investigated on Block 8. Five (5) properties have been proposed for further investigation (Lots 1,6,7,9 and 10). Nine properties (Lots 2,3,4,5,10A, 12 and 15) including one lot (Lot 15A) have been slated for no further investigation Lot 15 A is an active commercial business, however, the characteristics of the soil identifies evidence of what may be FMGP waste material (COPCs) present in the soils. Please explain how NEGC justifies that no further investigation activities are warranted when field observations and analytical testing indicate that fill on these properties contains waste contaminants and/or byproducts from the former MGP facility.
33. The SIR states that soils at Lot 1's eastern sampling location are most consistent with suspected fill. This fill was also observed on Lots 4, 10A, 12 and 15A; however, none of these lots were proposed for further investigation.
34. NEGC states that agricultural soils are suspected on Lots 2, 11, 15 and a portion of 7. However, there has not been any Pesticide or Herbicide soil sampling to confirm or deny that the COPC's are from agricultural activities. See also Comment #7 General Comments.
35. Please explain why Lots 2, 3, 4, and 5 are not proposed for further investigation given that they all had confirmed soil testing which identified PAHs and Inorganic Metals present in the property soils.
36. Please explain why there was no 0-2 foot samples obtained from the deep boring locations.
37. Please explain why there were no 0-6 inch samples from Lots 9,10A, 12 and 15.
38. Please explain why there was a lack of soil samples obtained from Lots 3, 4, 5 10, 10A, 11A 12 and 15.
39. The Department could not locate Boring Sheet 0811SS4 in the appendices.
40. Please explain the discrepancy in Duplicate 17 and 0801-SS1. Was this variation in the duplicate acceptable to the data validators?

(BLOCK 15)

41. Ten properties were investigated by NEGC. Three properties (Lots 4,6,12) have been proposed for further investigation; however, the remaining seven properties (Lots 1,5,7,8,9,10,and 11) have not been proposed for further investigation. The SIR states that fill material was observed on Lots 1,5,10 and 11, however, no further investigation is planned. If the fill material contains COPCs that may be from the FMGP, please explain why no further investigation is being proposed for these lots.

42. Lot 1 was identified as having approximately 8 feet of fill material that included glass, ash, PAHs and a chemical odor. Cyanide was also detected on Lot 1 at one location above the Residential Direct Exposure Criteria and at several locations in lower concentrations. Please explain the basis for not including Lot 1 in the next phase of the investigation.
43. The SIR indicates that several of the property borings in Block 15 were identified as having reworked soils although the reworked soil borings do not correspond with the lots which will be subject to further investigation. Please explain.
44. Please explain how NEGC justifies no further investigation activities on Lot 1, 5, 10 and 11 when field observations and analytical testing indicate that fill on these properties may contain contaminants and/or byproducts (COPCs) from the former MGP facility.
45. The SIR identifies that Lots 4, 6, 8, 9, 10 and 11 had only a limited number of samples performed. Please explain.
46. Please explain why Lots 7, 8, 9 and 10 were not proposed for further investigation when the boring logs indicated that dark soils, coal, blue gravel and glass were observed. In addition, there was PID readings on Lots 7 and 8.
47. The SIR states that Lots 8, 12 and part of 11 appeared to have been used for agricultural purposes. However, there has not been any Pesticide or Herbicide soil sampling to confirm or deny that the COPC's are from agricultural activities. See comment #7 General Comments.

(Block 16)

48. NEGC investigated eight properties on Block 16. Four properties (Lots 4, 6A, 7 and 8) have been selected for further investigation. The remaining four properties (lots 5, 6, 6B and 9) have not been selected for further investigation; however, sampling results indicate the presence of PAHs in the property soils. The report states that "suspected" fill was observed on Lots 4, 6A, 6B, 8 and 9, however, no further investigation is planned on Lots 6B and 9. Please explain why no further investigation activities are warranted when the SIR identifies by field observation and analytical testing that fill on these properties may contain waste contaminants and/or byproducts from the former MGP facility.
49. The SIR states that a portion of Lot 9 was used for agriculture however; there has not been any pesticide or herbicide soil sampling performed to confirm or deny the claim. See also Comment # 7 General Comments.
50. Please explain how NEGC determined that there was no commingling of former MGP waste materials on Lot 5 with the soils that appear to contain historical waste material from the hat company given that

Mercury is a COPC at the former MGP facility along with PAHs and Inorganic Metals.

51. The SIR identifies that Lots 6, 6A, 6B and 7 had only a limited number of samples performed on them. Please explain why.
52. Please explain the detected presence of lead, arsenic and PAHs in the 0-2 foot soil horizon across Lot 9 that is further supported by an observed waste layer in the boring descriptions.

[BLOCK 17]

53. The Department requests that all of the properties (Lots 3, 4, 4A, 5, 5A) included as part of the first Site Investigation for Block 17 be further investigated as part of the second phase of the Site Investigation along with Lots 1,2 and 6. (See comment #3 General Comments)

[BLOCK 21]

54. NEGC investigated four (4) properties located on Block 21. There is no further site investigation work planned for these lots, however, even though boring logs indicate that fill material is present on all four lots and that all four lots contain COPCs which may be from the FMGP. Please explain.
55. The SIR identifies dark colored soils with coal fragments on Lot 2. Only a limited number of samples were obtained, however lead and beryllium was found to exceed the Residential Direct Exposure Criteria. Also, two sampling locations indicated low PID observations. The SIR, however, contains no discussion as to what was present. Please explain.
56. The SIR identifies dark colored soils, slag, and PAHs on Lot 3. Benzo (a) pyrene was also found to exceed the Residential Direct Exposure Criteria in one location. Please explain why this property was not selected for further investigation given that limited samples were obtained, waste fill materials were observed, and at least one area was found to contain benzo (a) pyrene above the residential objective.
57. The SIR identifies fill material on Lot 4. Based upon the limited sampling that was performed, please explain why this property was not proposed for further investigation.
58. The SIR identifies fill material on Lot 5. Based upon the limited sampling that was performed and the confirmed presence of lead, arsenic and PAHs in at least one sample, please explain why this property was not proposed for further investigation.

[Block 22]

59. NEGC investigated five (5) properties on Block 22 (Lots 2,3,4,5,6). The SIR has proposed further investigation only on Lot 6.

However, a statement on Page 26 of the SIR states, "Observations of suspect fill materials were limited to 2202-1 and 2206-2 and appeared to be confined to the upper two feet". The remaining Lots 2, 3, 4 and 5, have been identified as having fill material and re-worked soils because NEGC has identified them as such however, NEGC is claiming that the contaminants detected or conditions observed on specific parcels are not associated with former MGP waste. Please explain and provide the Department with supporting evidence that the COPCs identified was not from the FMGP.

60. PAHs, Lead and Arsenic were observed on Lot 2. Based upon the limited sampling performed, please explain why no 0-6 inch soil samples were obtained.
61. On Lot 5, the SIR indicates that arsenic was detected in the soil sampling results, and green and blue coloration was observed. Please explain why this property was not proposed for further investigation given that arsenic is a COPC in FMGP waste. (And the fact that the two abutting properties to the north NEGC claims the onsite contamination is not their responsibility.
62. The SIR states that no VOC's were detected, however, Naphthalene (a VOC and SVOC) was detected by EA Engineering in the nearby sampling location in Judson Street. Please explain if NEGC believes that this Naphthalene contamination is from this property or from FMGP material under the road.
63. The road survey being performed by a survey company for NEGC should be included with the re-submittal of the SIR.

Site Investigation Report- 11 A-Connell Street
(Plat 8-7 Block 16 Lot 5) Carvalho Property

1. The Department does not concur with NEGC that this property should be removed from the Bay Street Neighborhood Study Area being performed by NEGC.
2. The SIR Report states that this "property appears to have different contamination characteristics and have been impacted by other potential responsible parties." The SIR should identify whom the potential other responsible parties are for the contamination observed and detected by laboratory analysis.
3. NEGC states that "RIDEM has alleged that portions of the fill may have originated from a former manufactured gas plant". The Department's understanding is based on Department records, information provided by the Town of Tiverton and from numerous long-term residents of the area. It is the Department's understanding that Southern Union Company purchased the former Fall River Gas Company approximately four years ago and now operates as New England Gas Company.
4. The property subject to this investigation is located to the east of

Bay Street and is not the same property that VHB cites where a former chemical works company operated or the hat company operated.

5. The SIR Report states that Mercury, Lead and Arsenic were found on the property. Mercury, Lead and Arsenic are all COPC from waste materials of FMGP facilities.
6. NEGC has stated that they cannot determine the source of the coal dust observed in the property samples; however, coal dust and ash are two COPC from waste materials of FMGP facilities.
7. Please explain how NEGC determined that the Lead discovered on the property came from lead based paint. To the Department's knowledge there was no sampling of the building structures or drip edges conducted by VHB. Once again, lead is a COPC for former FMGP facilities.
8. Please explain the following: VHB states in the SIWP and this report that "the goal of the investigatory activities was to gather sufficient data to allow an assessment of the nature and extent of the suspected fill". However, VHB forgot to include the rest of the sentence that states "... and attempt to determine potential sources of petroleum related impacts" which is in the SIWP.
 - a. VHB's certification, on behalf of NEGC, that to the best of their knowledge and at the time of completion, the information contained herein is a complete and accurate representation of Site Conditions is contradicted by the statement that they make. VHB has stated that they obtained and relied upon information from multiple sources to form certain conclusions regarding potential environmental issues at and in the vicinity of the subject property and except as otherwise noted, no attempt has been made by (VHB) to verify the accuracy or completeness of such information. VHB goes on to state that the findings, observations and conclusions presented in this report are limited by the scope of services outlined in the Bay Street Suspected Fill Area Site Investigation Work Plan dated April 2003.
9. Please explain the statement in the SIR Executive Summary that the PAHs exceed the Residential Direct Exposure Criteria (RDEC) consistent with the findings of the Bay Street Suspected Fill Area SIR but they cannot determine the source of the PAHs except to say that they may be from the fire pit. PAHs were also observed on the other side of the property at sampling locations SS-1 and SS-2. If the PAHs are consistent with the Bay Street Neighborhood Study Area site investigation, then the Department cannot rule out the suspected source being FMGP waste.
10. Please explain the rationale used by NEGC to select the three (3) locations on the property where all of the samples collected came from. How did VHB determine the nature and extent of potential surface soil and subsurface soil on this 14, 375 square foot L shaped property?

11. Please explain how NEGC determined that the "uncombusted coal dust " observed across the property was the same as the fire pit ash. Is it possible that the coal dust was from the FMGP?
12. Arsenic and beryllium are COPCs from FMGP facilities. Insufficient information was contained in the SIR to conclude that these contaminants are due to elevated background conditions.
13. On page 15 of the SIR, NEGC identifies that there are elevated levels of lead and arsenic in the top six inches of soils and that there are concentrations of mercury, arsenic, benzo (a) pyrene and chrysene in the 0-2 foot surface soils above the RDEC. All of the constituents are COPCs of FMGP facilities.
14. The Department does not concur that NEGC's investigation of this property was consistent with the approved SIWP. The SIWP approved by the Department was to take four surface soil samples from 0-2 feet around the property and take 1 or 2 subsurface soil samples from locations on the property. Environ requested that they wanted VHB to also take 0-6 inch samples as part of assessing risk. In this investigation, VHB (on behalf of NEGC) obtained 3 surface soils from 0-6 inches, 3 surface soils from 0-2 feet and one subsurface soil sample in addition to sampling the discovered felt material and surrounding soil. All of the samples, however, not including the felt material, were taken from the same three sample locations. That clearly disputes any statements or opinions that the nature and extent of contamination were determined.

Site Investigation Report

**Plat 8-7, Block 17, Lots 3,4,4A, & 5A
Property owned by John & Junya Cambra**

and

Plat 8-7, Block 17, Lot 5

Property owned by Francis R. & Isabella M. Correia

1. The Department does not concur with NEGC that this SIR is complete and that these properties mentioned above should be severed from the "Bay Street Suspected Fill Area" SIR.
2. The SIR submitted indicates that these lots or portions of these lots were used for residential activities dating as far back as 1890 and 1900. The SIR further states that John Simpson Jr. operated a trucking, excavating and rigging business at 2 Bay Street in 1921 and at 15 State Avenue in 1931. Please clarify what lots were associated with which of these addresses.

The SIR also states that John Simpson Inc. purchased Lot 3 in 1968, purchased Lot 4 in 1955 and purchased Lot 5 in 1949. Alvin B. &

Georgiana Simpson purchased Lot 4A in 1971 and Lot 5A in 1974. The SIR is unclear as to who owned and operated the property or portions of properties from 1890 to the dates listed in Table 1. The Department can only assume that residential homes have been present since 1890 and that residential were the predominant use of the properties. The SIR does not indicate whether or not the contamination was present prior to the Simpson's commercial business or ownership. It should be noted that even if the Simpson's operated on these properties, the former Fall River Manufactured Gas Plant still has some liability if the waste material came from that facility.

3. The Department does not concur that just because there was some historical use of the property in a commercial capacity that that justifies severing the properties from the overall Bay Street Suspected Fill Area investigation. The fact that NEGC observed and detected COPCs (which from the reference document used by Environ states that these contaminants are associated with FMGP facilities) in the property soils supports keeping the properties within the Bay Street Neighborhood Study Area investigation. NEGC has not provided specific information about the John Simpson, Inc. Construction Company's activities regarding contamination on the lots or in the road and public right of ways, which appears to limit NEGC's own liability.
4. In the Introduction section once again, the SIR states that the goal of the investigatory activities was to gather sufficient data to allow an assessment of the nature and extent of the suspected fill. However, VHB forgot to include the rest of the sentence that states "... and attempt to determine potential sources of petroleum related impacts" which is in the SIWP.
5. Through out a majority of these lots which were the subject of this investigation, NEGC uses the following descriptions for the surface soils: stratified layers of ash, brick, slag, coal intermixed with sand, silt, gravel; fill mixed with debris; suspected fill with blue rock observed. Please explain how NEGC believes that these soils are not associated with FMGP materials when the descriptions are similar to what was observed at other areas of the investigation that NEGC has already agreed to go back and further investigate.
6. The boring logs presented as part of this SIR use the following descriptions for what was observed in the property soils: slag, ash, dark soils, brick fragments, dark gray ash, black ash, black coal dust, chemical odor, black crushed coal & ash and reworked soils. The data tables further confirm that PAHs, Inorganic Metals, trace Cyanide and some total petroleum hydrocarbons were present in the property soils. Please explain how these descriptions, observations, and laboratory detections differ from those found, identified and mentioned in Comment #8 General Comments above concerning the SIR for the Bay Street Suspected Fill Area investigation for lots along Judson Street.

7. Page 16- Please explain what background study was performed by VHB. The Department to date has not approved any background study in this area, which would be complicated given that the two COPCs are also found in FMGP waste materials.
8. On Lot 3, there is a 5600 ppm concentration of Lead that was detected. NEGC attributes this to the possibility that it came from lead paint. Were any paint chips observed, wipe tests performed, or soil sampling in the drip edge of any structure to support this assumption? Please explain.
9. Page 15 Observations- Please explain how on Lot 4 there was a PID reading at location 1704-2/SS-3 of 195.6 PPM from 1.75 to 2.3 feet BSG (BGS?) but the results indicate no evidence of a volatile compound. Page 16 the SIR states that the sample was taken at 4 to 5 feet BSG. Also, there was a strong chemical odor mentioned in the 1704-2/SS-3 boring log.

Further, the boring log for 1704A-1/SS2 indicates that dark fill material with brick and slag was observed in the upper 2 feet while a red stain soil with a slight chemical odor (2.3 PID) was observed at 4-8 feet. There does not appear to have been any sampling at depth below 5-8 feet. Please explain.

Please discuss if these PID readings may or may not be attributable to petroleum compounds and other COPCs related to the Former Fall River Gas Company and its waste materials.

10. The VHB certification, (on behalf of NEGC) that to the best of its knowledge at the time of completion, the information contained herein is a complete and accurate representation of Site Conditions contradicts the later qualifications that they make. VHB has stated that they have obtained and relied upon information from multiple sources to form certain conclusions regarding potential environmental issues at and in the vicinity of the subject property and except as otherwise noted, no attempt has been made by (VHB) to verify the accuracy or completeness of such information. VHB goes on to state that the findings, observations and conclusions presented in this report are limited by the scope of services outlined in the Bay Street Suspected Fill Area Site Investigation Work Plan dated April 2003 and that they have made no attempt to assess the compliance status of the past owners and operators of these lots.
11. The Department does not concur that VHB's investigation of this property was consistent with the approved SIWP. The SIWP approved by the Department was to take four surface soil samples from 0-2 feet around the property and take 1 or 2 subsurface soil samples from locations on the property. Lot 4A appears to have only 3 actual surface soil sampling locations and lot 5A appears to have only 2 actual surface soil sampling locations.

Site Investigation Report

Plat 8-7, Block 22, Lots 3&4

**Property owned by Theresa Farias,
Daniel Tercerio and Margret Anne Mederios**

1. The Department does not concur that the Site Investigation of these properties is complete.
2. The SIR submitted does not determine the nature and extent of contamination on these lots or the potential source of petroleum.
3. The SIR states that the lots are currently unimproved, however, they were used as an auto storage area in the 1950's or 1960's. The SIR should state whether or not the lots have approximately 40 + years of growth, and should also include estimations as to when the solid waste disposal occurred.
4. Please explain why no further effort was made to obtain samples from the western section of the lots. Given that these lots were undeveloped, a backhoe would have assisted VHB in further characterizing the nature and extent on these lots.
5. The SIR identifies that burnt wood was observed at location 2203-1 not far from Foote Street. However, no further investigation was made to determine if this material was evidence of former MGP waste materials or an isolated hit.
6. Please explain what background study was performed by VHB. The Department to date has not approved a background study in this area, which would be difficult given that Arsenic is a COPC of FMGP, waste materials.
7. The Department does not concur that just because there was some historical use of the property in a commercial capacity that that justifies severing the properties from the overall Bay Street Suspected Fill Area investigation. NEGC states that they observed solid waste and other materials on Lot 3 and that the vegetation observed was indicative of a previously disturbed site. COPCs were detected on Lot 3 (SS2A) and a large portion of Lot 3 and Lot 4 were not sampled. NEGC has not provided any information to support that the automobile towing storage company caused or contributed to the identified contamination on the lots or that the identified COPCs did not come from the FMGP.

Site Investigation Report

Plat 8-6, Block 8, Lot 15A

**Property owned by Manuel Cruz
(business on property Jack's Auto Shop)**

1. The Department does not concur that this property should be separated from the Bay Street Suspected Fill Area SIR. There has been no

information provided by NEGC that the contamination detected in the property soils did not originate from the FMGP.

2. NEGC states in the Executive Summary that the laboratory results from the sampling locations in this area are consistent with the results being identified in the Bay Street Suspected Fill Area SIR. This statement would seem to support the Department's position that this property should remain part of the Bay Street Neighborhood Study Area investigation.
3. NEGC identifies that there are concentrations of Lead in the property soil. NEGC attributes this to the possibility that it came from lead paint. However, there were not any paint chips observed, wipe tests performed, or soil samples from the drip edge of any structures to support this assumption. Please explain.
4. NEGC collected five soil samples from two boring locations on the property. Two samples from 0-6 inch depth, two samples from 0-2 foot depth, and one sample from greater than two feet. In one of the boring locations, black staining was observed at 1.5 feet below the surface while redoximorphic soils with iron cementation was observed at 2-3 feet. Please explain how five samples from two locations determine the nature and extent of contamination.
5. The SIR states that at sampling location 0815SS2 low levels of mercury and cyanide were observed which may be consistent with the Bay Street Suspected Fill Area results and the presence of FMGP waste. The boring log also identifies that at 3 feet BSG a black to very dark grayish brown soil and gravel were observed. This was followed by very dark soil with black staining and yellow brown cemented iron. These characteristics appear to be consistent with other areas identified in the SIR. Please explain why NEGC believes that the COPCs from the FMGP are not on this property, given this information.
6. Please explain why sampling at depth occurred below the water table at 6-7.5 feet BSG when waste materials were observed in the 0-4 foot BSG.
7. The EA consultant identified that at the sampling location Bay 10 (in proximity of the roadway) by EA Engineering, FID readings (11.5 PPM-45.8 PPM) were observed between 0-5 feet, however, that no samples were collected by EA Engineering for laboratory analysis. Please explain what steps were taken by NEGC to determine if the contaminants causing the FID readings originated on the property indicating a possible relationship to the automotive business or were they merely a hot spot of FMGP waste materials as found along Judson Street.

**RIDEM Comments by Rich Enander- Relative to the SIR
Office of Technical & Customer Assistance
Hazard Identification Step Comments
Bay Street Human Health Risk Assessment**

Following are the Department's comments concerning the adequacy of the "Hazard Identification" step of the Bay Street Human Health Risk Assessment report prepared by Environ International Corporation and dated October 2003. This review only covers sampling/COC identification issues and does not address the exposure assessment, toxicity assessment, or risk characterization steps of the risk assessment process. Comments on each of these three steps will be submitted under a separate cover.

2.2 Characterization of the Study Area

2.2.1 Definition of the Study Area and Description of Area Sampling Plan

- ◆ The 4th paragraph of this section (pg. 2-9) states that the site investigation work plan submitted by VHB "outlined the sampling plan, including the rationale for the placement of samples, ..." In the April 2003 version of the Work Plan, however, I could not find an outline of the rationale addressing the "placement" of surface soil samples. Further, a 28 April 2003 Health Department letter recommended that in order "to avoid misunderstanding of sampling goals" VHB should develop "criteria for selecting" surface and subsurface samples in order to ensure that they are representative of site conditions. Since I don't have copies of all correspondence with VHB, I am not sure whether OWM or DOH ever received a written response specific to this request.

- ◆ In determining the "placement of samples," VHB indicates that sample locations were "governed either by" 1) discussions with the homeowner, 2) visual inspection, or 3) property use constraints, and that "the number of samples obtained on each property was dependent on the size of the property" (pp. 2-9/2-10). Regarding sampling strategy design, did VHB consider or incorporate EPA soil sampling guidance (referenced by ENVIRON on pp. 1-6 and 1-7: *Soil Screening Guidance: Technical Background Document, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, and *Soil Screening Guidance: Users Guide*) specific to obtaining representative samples for use in SSL comparisons? With regard to surface soil sampling, for example, EPA provides guidance concerning representative random sampling methods and the number of samples that should be taken in order to gain a pre-specified level of statistical confidence. In this guidance, exposure areas for residential scenarios are defined in units of 0.5 acres (or actual lot size) with the random apportionment of 6 composite surface soil samples, consisting of 4 specimens each, per unit area. This design strategy is especially appropriate for the evaluation of vacant lots (as structures would not complicate the selection of random sample locations).

- ◆ Table 2-1. Constituents Included in the Analysis (Comments provided below)

2.2.2 Adequacy of Sampling

In this subsection, ENVIRON states that "there are no guidelines as to the required number of samples to be taken per unit (exposure) area." Two of the references cited by ENVIRON (*Soil Screening Guidance: Technical Background Document* and *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, pp. 1-6 and 1-7), however, do provide guidance (discussed above) regarding the number of surface soil samples that should be taken per unit exposure area. To state that a random sampling design is not "advisable," especially considering the presence of 13 vacant lots in the study area, at least 8 (10%) of which were sampled by VHB, is inconsistent with EPA guidance currently in effect. Further, the analogy to a "statistical survey" and "inferences" based on population samples (pg. 2-13) would be more appropriate if a random design strategy had been followed.

3 Hazard Identification

Tables 2-1 and 3-1 list "Constituents Included in the Analysis" and "Constituents of Principal Interest at MGP Sites," respectively. A comparison of the two tables shows that Table 2-1 does not include several elements (e.g., barium, manganese, and vanadium) which are associated with Manufactured Gas Plant (MGP) waste. In addition, As (included in Table 2-1 as a "constituent included in the analysis" and known to be present in MGP waste) is not carried through the ENVIRON human health risk assessment. EPA's current background guidance calls for "retaining constituents that exceed risk-based screening concentrations" in the baseline risk assessment; especially with regard to constituents that have potentially both "release-related" and "background-related" sources (*Policy Considerations for the Application of Background Data in Risk Assessment and Remedy Selection*, OSWER 9285.6-07P, April 2002). Further, based on the Department's current arsenic policy, I see no reason to exclude soils with concentrations >7ppm from further evaluation (pg. 3-6, >15 ppm remediated, <15 ppm not carried through the risk assessment).

Volume I of the Gas Research Institute's "Management of Manufactured Gas Plant Sites" guide referenced in Environs risk assessment, shows that MGP site-related waste could contain "volatile aromatics" (other than BETX) and "halogenated volatiles" (Table 3-12). Though surface and ground water samples were submitted for VOC analysis, quantitative independent laboratory data for VOCs in subsurface soils were not reported (though non-specific field screening using a portable PID unit was conducted at selected depths and locations). Also, though stated not to be "associated with coal gas production," contaminants such as PCBs and herbicides are said to have been found at MGP sites. Finally, in at least one study involving the site of a former Tallahassee "Cascade Park Gasification Plant" (EPA CERCLA site, www.epa.gov/Region4) EPA analyzed nine "surface soil" samples (typically defined by EPA as 0-2 cm in depth) for dioxin/furans - though it doesn't appear from the EPA fact sheet that elevated levels were found; a national inventory, undertaken by New Zealand's Ministry for the Environment, however, did find an upper end range of PCDD/PCDF's at four gasworks sites at levels "5 to 10 times higher than [that] measured in urban soils (pg. 131)" The New Zealand report does state, however, that "PCDDs and PCDFs have not been generally recognized as a priority contaminant of gasworks waste" (www.mfe.govt.nz/publications/hazardous/dioxin-emissions-inventory-mar00.pdf).

3.1 Constituents in Soil

3.1.1.2 Constituents That May Be in Manufactured Gas Plant Waste

Again, as noted above, a comparison of the two tables shows that Table 2-1 does not include several metals that are known to be associated with Manufactured Gas Plant (MGP) waste. In addition, As (known to be present in MGP waste) is not carried through the ENVIRON human health risk assessment. Further, the Gas Research Institute's publication indicates that VOCs (other than BETX), PCBs, and herbicides have been found at MGP sites (though the authors report that these potential contaminants of concern are indicative of activities/operations other than coal gas production).

3.1.1.4 Comparison of Background Concentrations

The decision to carry PAHs through the human health risk assessment as COPCs, while addressing anthropogenic sources in the Uncertainties Section, is appropriate and conservative. Similarly, OWM has determined that arsenic (shown to be present in MGP waste) should also be retained in the baseline risk assessment as it has potentially both "release-related" and "background-related" sources. Since beryllium has been found at concentrations at or above the RDEC criterion, the most conservative approach would also be to retain this metal in the baseline risk assessment. Background issues could then be discussed in the Risk Characterization and Uncertainties section of the report (per EPA background guidance).

3.1.1.5 Comparison to Soil Screening Levels

Method 3 risk assessments that include locations where Method 1 exceedences occur have historically been proposed to OWM only in cases where engineering and/or institutional controls on the property permit management of risk relative to any remaining contamination. Such cases therefore, require recording an ELUR on the property title to institutionalize the control. Additionally, the decision of whether to allow risk-based screening in a Method 3 risk assessment differs among states. The Massachusetts DEP, for example, does "not encourage risk-based screening, as it [can] defeat the purpose of looking at cumulative risks" (MADEP 2003). In general, MADEP allows a COPC to be dropped out if it is detected at low frequency, lab contaminant/error, or if it is present only at background and is not related to potential disposal practices. If screening is acceptable to the Department (beyond frequency of detection and laboratory contaminant, for example), then the following comments would apply.

- ◆ Text contained in the 2nd paragraph, pg. 3-7, is unclear to me. It appears on one hand that surface soil screening against Method 1 criteria may have been performed by VHB, but in Table 3-3 (as well as text on pg. 3-11) all site-wide data appear to be screened only against EPA SSLs.
- ◆ It would be more useful if the SSL column in Table 3-3 showed the most conservative SSL value from among RDEC, EPA 2001 Soil Screening Guidance SSLs, EPA Region 9 SSLs, and RIDEM Method 2 derived criteria (with footnotes specifying the origin of each value).
- ◆ Table 3-2, Method 1 column. Obviously several metal, PCB, and pesticide values, for example, are excluded as soil samples were not subjected to laboratory analysis for these constituents. Therefore, cumulative risks that incorporate these constituents cannot be assessed.

- ◆ Table 3-2, "Derived Method 2 Direct Exposure Criteria" column. ENVIRON indicates that threshold levels in this column were calculated using DEM equations along with the latest IRIS toxicity values and EPA soil screening guidance. Though some Method 2 calculated values were found to have higher thresholds, such values have not been accepted in the past in place of more stringent Method 1 values; the Method 2 approach is generally applicable to chemicals where residential Method 1 criteria do not exist. However, where new more conservative EPA toxicity values exist, as in the case of hexavalent chromium, or where C_{sat} default values result in lower screening thresholds, it makes sense to use these more public health protective values as a screening tool. Further, though the Method 2 calculations were (with the above exceptions) mostly based on the same default values and equations used in the derivation of RIDEM Method 1 numbers, ENVIRON used a less conservative averaging time for carcinogens, 75 years, where DEM and EPA (in their most recent 2001 soil screening guidance) use a 70 year life span. In some cases, the derived Method 2 numbers not only exceed both the RIDEM Method 1 RDEC and USEPA SSLs shown in columns 3 and 5, but also exceed conservative USEPA Region 9 residential soil screening levels. It should be noted that the Method 2 algorithms are not as comprehensive as Region 9's, which combine ingestion, dermal, and inhalation exposures.
- ◆ Where EPA generic residential SSLs (2001) were not available, ENVIRON calculated derived soil screening levels using EPA methodology published in EPA's *Soil Screening User's Guide* (1996) and *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (2001). The EPA methodology allows risk assessors to substitute local/regional values into certain calculations; e.g., Q/C_{wind} air dispersion factor used in PEF derivation (calculation resulted in a value similar, differing by a factor of 3, to the default PEF used by RIDEM). Again, ENVIRON used a 75-year averaging time (EPA 1997) in place of the 70-year more conservative default used in more recent guidance (EPA 2001; DEM RDEC 2003 amendments).

As a final note, EPA New England generally prefers to use Region 9 residential soil screening levels as the list of chemicals is more comprehensive and the threshold levels are viewed as being among the most conservative as, again, they combine three plausible residential exposure pathways - soil ingestion, dermal contact, and inhalation.

3.1.1.6 Cumulative Risk

Screening of carcinogenic COPCs is shown to be based on the ratio of each constituent's maximum detected concentration/DL to its SSL. The rationale is based on ratios that are <0.25 ($1E-06 \times 0.25 = 2.5E-07$) with the implication that contaminants should be dropped from further evaluation as it could take up to 40 contaminants at equivalent concentrations of $2.5E-07$ to equal $1E-05$ ($1E-05/2.5E-07$). For noncarcinogens, 0.1 is used for chemicals that have the same "target tissue." In general, EPA's soil screening guidance does not establish threshold-screening limits based on contaminant/SSL ratios - i.e., all ratios are essentially summed with a risk management decision based on this tally. The proposed approach could be viewed as sufficiently conservative if the most conservative SSL (including those developed by Region 9) were to be used in each instance; based on the

presumption that adequate and thorough sampling and analysis of each property has been achieved.

A comparison of the SSLs listed in Tables 3-2 and 3-3 suggests, however, that the most conservative SSL was not used (including established Method 1 levels). As described in the text, concentration limits appear to have been compared only to USEPA derived SSLs (column 2, Table 3-3); for example, the EPA derived value of 400 mg/kg was used as a screening level for ethylbenzene in place of DEM's Method 1 Direct Exposure Criteria regulatory limit of 71 mg/kg.

3.1.2 Constituents of Potential Concern in Soil

Based upon the screening criteria established by ENVIRON, Table 3-4 provides a summary of their COPC evaluation. Of the 89 constituents listed, 64 or 71% were eliminated from further evaluation based on the criteria identified in the table. As previously discussed, both arsenic (though frequently detected above 7 ppm) was not carried forward in the baseline risk assessment.

BULLET 1. Of the 64 constituents eliminated, 35 (55%) were "never" detected in any "area" sample with all detection limits less than the listed USEPA SSL. Though these constituents were not detected at detection limits lower than the EPA 2001 soil screening guidance SSLs, a more conservative approach (as discussed earlier) would be to compare the detection limits first to RIDEM's Method 1 criteria and then to the most conservative value among the other available screening levels: EPA 2001 published values, USEPA Region 9 published values, SSLs calculated based on EPA algorithms, and calculated Method 2 values. If this were done, for example, the Method 1 RDEC for antimony of 10 mg/kg would be used in place of EPA's 31 mg/kg SSL, resulting in instances where sample detection limits were at or above RIDEM's Method 1 criterion.

In addition, the text on page 3-17 states that "while some of these constituents could theoretically be present in MGP material (see Table 3-1), they are volatile constituents and would not be expected to be present in material in place for long periods of time." While this may be true of surface soils, contamination at depth may last considerably longer. Further, several of the constituents eliminated are metals (antimony, selenium, and thallium - all MGP-related metals), and as such, would be expected to remain in place.

BULLETS 2-4. Of the 64 constituents eliminated from further evaluation, 29 (45%) were dropped based on the criteria contained in these bullets (pp. 3-17 to 3-3-19). Again, same comments regarding SSL comparisons as above apply here. In addition, the fact that a constituent is not expected to be present based on a single industry publication, and considering that knowledge does not exist concerning whether such COPCs could have been co-mingled with typical MGP wastes or independently disposed of in suspect areas.

3.3 Definition of Exposure Areas

Same comments regarding SSL screening as above.

- ◆ 1st paragraph, 6th sentence pg. 3-22. The later part of this sentence suggests that sampling on some "individual properties may have been limited." It would be helpful if ENVIRON could provide a comprehensive list of those properties which may have had limited surface or subsurface sampling.

3.4 Selection of Individual Lots Requiring Further Evaluation

Same comments regarding SSL screening as above.

- ◆ The criterion for calculating cumulative carcinogenic risks appears to be different than that previously described.

- ◆ Figure 3-2. Several blocks are shaded gray, indicating that they were not included in the assessment. There seems to be some inconsistency between those shaded/not shaded gray and those indicated in the 1st paragraph of Section 3.3 pg. 3-21.