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GEI Consultants, Inc.

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VOLUME I: TEXT  
PHASE II COMPREHENSIVE SITE ASSESSMENT  
70 SOBIN PARK SOUTH SITE  
ONE GILLETTE PARK  
DEP SITE NUMBER 3-11312  
SOUTH BOSTON, MASSACHUSETTS

Submitted to:

**Gillette Manufacturing (USA), Inc.**  
**South Boston, Massachusetts**

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1021 Main Street  
Winchester, MA 01890-1970  
(781) 721-4000

October 21, 1998  
Project 97128-2

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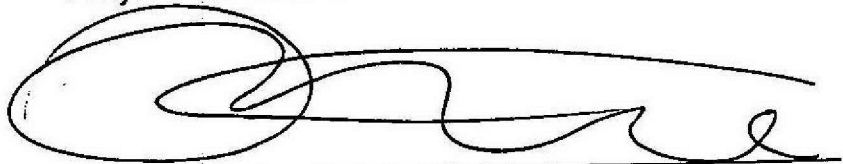
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A handwritten signature in black ink, appearing to read 'Ileen S. Gladstone', written over a horizontal line.

**Ileen S. Gladstone, P.E., LSP  
Project Manager**

## EXECUTIVE SUMMARY

### Introduction

On behalf of Gillette Manufacturing (USA), Inc. (Gillette), GEI Consultants, Inc. (GEI) completed a Phase II Comprehensive Site Assessment under the Massachusetts Contingency Plan (MCP). This Phase II report covers the Sobin Park South Site (the Site), Release Tracking Number (RTN) 3-11312, located at Gillette's South Boston Manufacturing Center (SBMC), Fig. ES-1. The site extends from A Street (on the east) to Dorchester Avenue and to beneath the Fort Point Channel (on the west) from West 2<sup>nd</sup> Street to the Central Artery/Tunnel (CA/T) Casting Basin.

The purpose of the Phase II was to, 1) evaluate the source, nature, extent and potential impacts of releases, 2) evaluate the risk of harm to human health, public safety, public welfare and the environment, and 3) provide a basis for identifying and evaluating remedial action alternatives.

The scope of the Phase II included 1) reviewing historical information, 2) sampling numerous soil borings and monitoring wells, 3) analyzing aquifer characteristics, 4) preparing a model to simulate bedrock ground water flow, 5) analyzing indoor air quality samples, 6) sealing a dry well, 7) analyzing water samples from the Massachusetts Bay Transit Authority (MBTA) Red Line Tunnel, and 8) preparing a Method 3 risk characterization and this Phase II report.

### Subsurface Conditions

The subsurface conditions (Fig. ES-2) consist of fill soils, peat, and organic silts that overlie a 40-foot-thick clay layer. Below the clay there is glacial till overlying bedrock.

The shallow soils above the clay comprise the **shallow** aquifer. The till and bedrock comprise the **deep** aquifer. Neither aquifer is used as a source of drinking water.

The ground water in the shallow aquifer on the west side of Z Building flows generally toward Fort Point Channel and the gradients are affected by the tides. On the east side of Z Building there is no consistent flow direction.

Prior to construction of the Casting Basin, the ground water in the deep aquifer flowed generally north-northwesterly. Since August 1996, the ground water has been pumped from and recharged to the deep aquifer as part of the construction of the CA/T Casting Basin. The project's

dewatering operations to maintain the Casting Basin dry and stable, and reinjection operations to maintain the integrity of the Gillette facility buildings, have had an effect on the deep ground water flow patterns at, and adjacent to, the Site.

### Site Contamination *(am 66)*

- 1) *Dry Well in the basement of Z Building:* Releases of chlorinated solvents (trichlorethene and tetrachloroethene) in Area B, shown in Fig. ES-1, are believed to be the most significant source of contamination at the Site. These releases resulted in soil and ground water contamination in the overburden and bedrock and the presence of pure solvent, which in this case is a Dense Non Aqueous Phase Liquid (DNAPL).

Typically, the clay separating the shallow and deep aquifers impedes the flow of water between them. However, the piles that support Z Building allow water and separate phase solvents to leak downward along the periphery of the piles past the clay, into the till and bedrock as illustrated in Fig. ES-2.

The approximate extent of chlorinated solvent contamination in the shallow and deep aquifers resulting from this release is illustrated in Fig. ES-1.

- 2) *168 A Street and 64-76 Sobin Park Road:* Releases of chlorinated solvents to the ground surface in Area A, shown on Fig. ES-1, resulted in soil and ground water contamination that is limited to the overburden above the clay.   
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- 3) *Historic filling:* Historic fill used to create a portion of the property contained debris and coal-ash that is likely a source of some the petroleum hydrocarbon contamination at the Site. The fill was placed over any oil and/or debris that may have accumulated along the bottom of the former Fort Point Channel.
- 4) *Underground Storage Tanks (USTs):* Releases of petroleum hydrocarbons resulted primarily in soil contamination that was limited to the overburden above the clay. The extent of migration from these releases appears to be limited.
- 5) *Other contamination:* Some evidence suggests minor spills of petroleum and solvents at a few locations. These are limited to the fill deposits.

### Extent of Chlorinated Solvent Contamination

Chlorinated solvent DNAPL exists in the shallow aquifer beneath and east of the Z Building, i.e., on the side where the Materials Handling Center (MHC) is located. The DNAPL sank to the organic silt, silt or clay and flowed downslope on these relatively impervious surfaces until piles were intercepted. DNAPL then migrated down the piles into the deep aquifer. In the bedrock, the DNAPL flows down into the steeply dipping and closely-spaced fractures. DNAPL has not been observed on the west side of Z Building, i.e., on the Fort Point Channel side.

Dissolved phase contamination exists in the shallow and deep aquifers and in the clay that separates the aquifers. In the shallow aquifer, dissolved phase contamination (over 100,000  $\mu\text{g/l}$ ) exists east of Z Building, but has not migrated west of Z Building in significant concentrations. In the deep aquifer, dissolved phase contamination (over 100,000  $\mu\text{g/l}$ ) exists on the east and west sides of Z Building. Thus, the dissolved phase contamination flowed down gradient, i.e., north-northwesterly, and spread out laterally as it passed to the west side of Z Building and into the till and bedrock beneath the clay in Fort Point Channel (Fig. ES-2).

Water samples in the sump in the MBTA Red Line tunnel (Figs. ES-1 and ES-2) which is potentially in the path of the plume, showed no chlorinated VOCs. Due to dewatering activities, part of the dissolved phase plume in the deep aquifer is being drawn toward the CA/T Casting Basin dewatering wells. To date, only low levels, currently about 6  $\mu\text{g/l}$  of trichloroethene, have been detected in these pumping wells.

Soil contamination typically was identified in the same locations as were the dissolved phase and the DNAPL.

The dry well in the basement of Z Building was sealed with concrete and a gasketed and bolted metal cover to eliminate it as a potential pathway for solvent vapor to enter the indoor air. The concentrations in air in Z Building basement are negligible.

### Extent of Petroleum Hydrocarbon Contamination

Petroleum hydrocarbons associated with historic filling activities are mostly immobile and found throughout this section of South Boston. Petroleum hydrocarbons associated with former USTs have resulted primarily in soil contamination that is limited to the immediate vicinity of the former USTs.

### Preliminary Response Actions

Response actions at the Site have included sealing the dry well in the Z Building, removing USTs, removing oil-contaminated soil, installing two recovery wells and regularly removing accumulated separate phase product from one of them, and installing a vapor barrier under the MHC.

### Potential Risks of Contamination

A Method 3 site-specific, risk characterization was performed to evaluate the potential harm to human health and the environment. For this purpose GEI assumed that the SBMC would remain as a manufacturing or commercial facility for the foreseeable future. The results are as follows:

- The contamination does not pose a significant risk to on-site workers.
- The contamination does pose potential significant risk to any construction workers who excavate into the soils near the contamination on the east side of Z Building. This potential risk will be mitigated by instituting deed restrictions and developing risk management protocols.
- The contamination does not pose a significant risk to users of the Red Line Tunnel.
- The contamination does not pose a significant risk to users of the future CA/T Tunnel.
- The contamination does not pose a significant risk to the environment, including marine life in the Fort Point Channel.
- The contamination does not pose a substantial hazard to the public welfare.
- The contamination does not pose a significant risk to public safety.