LEVINE·FRICKE

November 13, 1989 LF-1597

RESULTS OF
QUARTERLY GROUND-WATER MONITORING
FOR THE PERIOD OCTOBER THROUGH DECEMBER 1989
3300 WEBSTER STREET
OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of quarterly ground-water monitoring conducted for the period September through November 1989 by Levine·Fricke for the property at 3300 Webster Street, Oakland, California ("the Site;" Figure 1). This monitoring was requested by the Regional Water Quality Control Board in a letter to Mr. Roy Ikeda of Crosby, Heafey, Roach & May dated September 11, 1989. Also included is an evaluation of the total dissolved solids in ground water with a review of the potential beneficial use of ground water, performed pursuant to State Water Resources Control Board (RWQCB) Policy 88-63. This report presents graphic and tabular presentations and discussion of water-level and water-quality data for the period.

Ground-water samples were collected from four on- and off-site monitoring wells on October 4, 1989. Ground-water elevations were also measured in each well on the same day. Samples were collected from wells LF-1, LF-2, LF-3 and LF-4 and analyzed for total petroleum hydrocarbons (TPH) by EPA Method 8015 and for benzene, toluene, ethylbenzene, and xylene (BTEX) by EPA Method 8020.

2.0 GROUND-WATER ELEVATION AND FLOW

Based on measurements of on- and off-site ground-water levels and calculated ground-water elevations on the measurement date, the observed shallow ground-water flow direction was toward the south to southwest (Figure 2). This flow direction differs somewhat from that reported in the Levine·Fricke report titled "Soil and Ground-Water Investigation, 3300 Webster Street, Oakland, California" dated July 27, 1989. The main observable difference is a lowering of the water level in well LF-1 by approximately 5 feet since May of 1989. The reason for this water level decline is not readily apparent; however, it may reflect either a seasonal change in water levels, or a change in lawn irrigation practices in the landscaped areas of the Site and surrounding area.

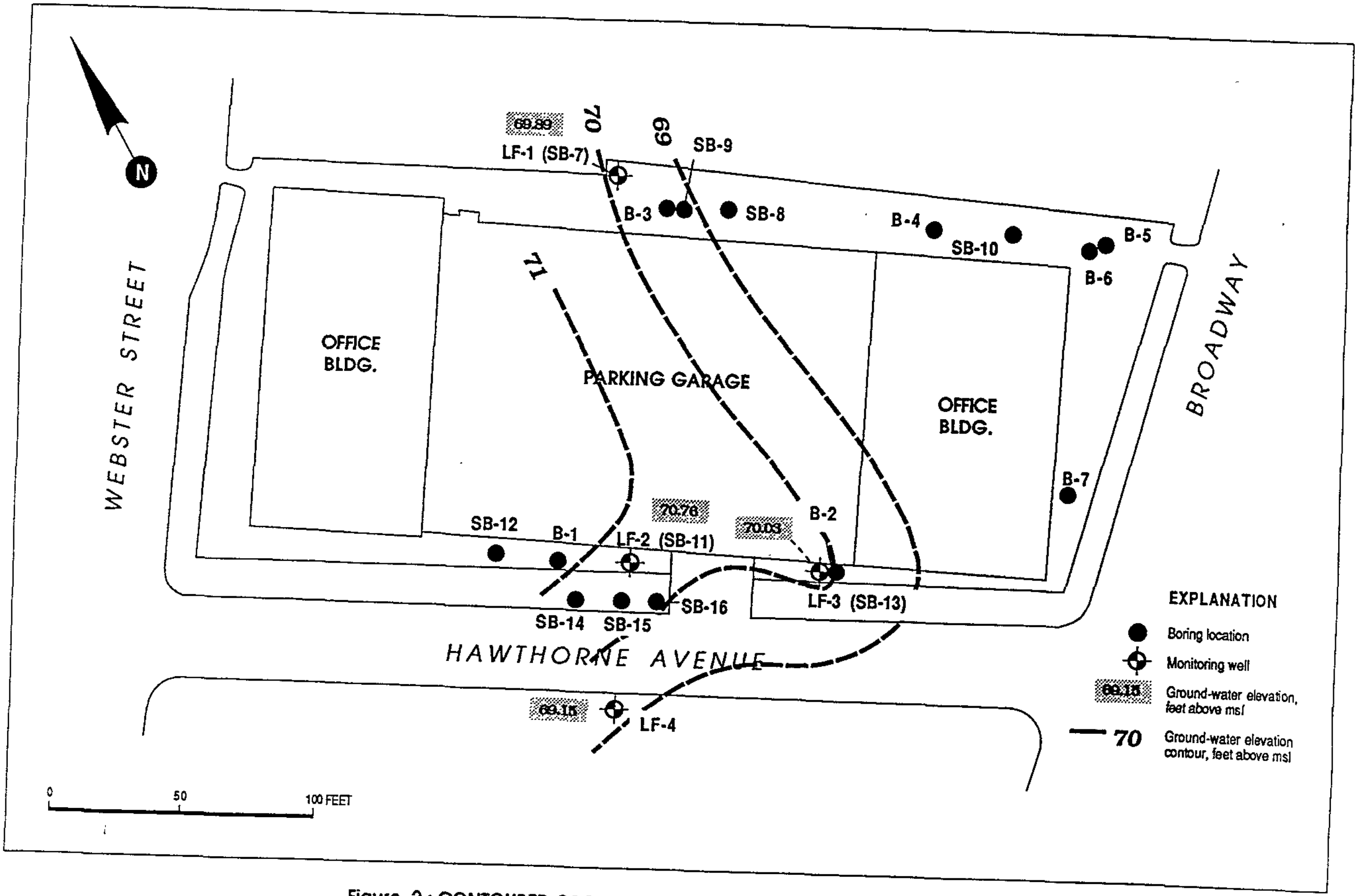

Figure 2 : CONTOURED GROUND-WATERT ELEVATIONS, JANUARY 9, 1990

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3.0 GROUND-WATER QUALITY

Sampling and Analytical Procedures

Three to ten well volumes were purged from each well prior to sampling. The wells were purged by bailing the wells with a Teflon bailer. The purging and sampling equipment used for each well was steam-cleaned prior to use. Field measurements of temperature, pH, and specific conductance of the evacuated water were recorded during purging.

After purging each well, a water sample was collected using a clean Teflon bailer. The samples were then placed in six 40-ml glass volatile organic analysis (VOA) vials. The sample vials were gently filled to overflowing, capped, and checked for trapped air by inverting and tapping each vial. If an air bubble was found, a new vial was filled.

Before each use, the Teflon bailer was cleaned with Alconox (a laboratory-grade detergent), steam-cleaned, and fitted with new polypropylene rope. One duplicate and one field blank sample was collected for quality control purposes. The field blank sample was collected by pouring organic-free water into the bailer and then decanting it into 40-ml glass VOA vials prior to lowering the bailer into the well. All samples were stored in a chilled ice chest for transport to the chemical laboratory.

Brown and Caldwell Laboratories of Emeryville, California, a State-certified laboratory, analyzed the samples from each well using EPA Methods 8015 and 8020. Brown and Caldwell also analyzed the duplicate and field blank samples using the same analytical methods.

4.0 WATER-QUALITY RESULTS

The October 1989 water-quality analysis results are summarized in Figure 3 and Table 1; laboratory certificates are included in Appendix A.

The analytical results were similar to previous sampling results, with the exception of wells LF-2 and LF-4.

No organic compounds were detected in ground-water samples from wells LF-1 and LF-3 using EPA Method 8015 and 8020. These results are in agreement with previous data collected in March and May 1989.

Analytical results for well LF-2, however, reported the first detection of chlorobenzene (0.001 ppm in the primary sample and 0.0095 ppm in the duplicate), and ethylbenzene (0.023 ppm in the primary sample and 0.023 ppm in the duplicate). TPH as gasoline was not detected during the October sampling, in contrast to TPH (as gasoline) concentrations of 8.3 ppm and 5.3 ppm reported previously in March and May 1989, respectively. Concentrations of benzene at well LF-2 were similar to those reported for May 1989, and were significantly below the initial March 1989 detection concentration of 0.870 ppm.

Analytical results for monitoring well LF-4 reported the first detection of total xylene isomers at a concentration of 0.0016 ppm. Previous results (May 1989) from this well reported no detectable TPH or aromatic organic compounds in ground-water samples from this well.

5.0 BENEFICIAL USES OF DRINKING WATER

Additional ground-water samples were collected from well LF-3 for analysis of total dissolved solids (TDS). This analysis was performed to assess if ground water from this zone could be considered suitable, or potentially suitable, for municipal or domestic water supply, as outlined by State Water Resources Control Board Resolution No. 88-63. Well LF-3 was chosen for this analysis because it is located in an area of non-affected ground water adjacent to the affected area of ground water detected at well LF-2.

Analysis results at well LF-3 reported a specific conductance of 670 umhos/cm, filterable residue (TDS) of 430 mg/L, and pH of 6.2.

As defined by Resolution 88-63, all surface and ground waters of the State are considered to be suitable or potentially suitable for municipal or domestic water supply with the exception of surface or ground waters where:

a) The total dissolved solids (TDS) exceed 3,000 mg/L, electrical conductivity exceeds 5,000 uS/cm, and the ground water is not reasonably expected by regional boards to supply a public water system.

b) There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices.

c) The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

d) The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

Since the TDS analysis results of the ground water samples from well LF-3 do not meet any of the exception requirements referenced above, the ground water at the Site could be considered suitable or potentially suitable for municipal or domestic water supply and, therefore, could be so designated by the RWQCB.

Analyses, however were not conducted for other naturally occurring or background constituents, as stated in item B above, which might cause the ground water at the Site to be considered unsuitable for municipal or domestic water supply.

6.0 QA/QC RESULTS

Duplicate samples obtained from well LF-2 were submitted to Brown and Caldwell for analysis as a Quality Assurance/Quality Control check. Data precision of analytical results for duplicate samples is assessed by the relative percent difference (RPD) parameter, which is defined as the absolute value of the difference between two values divided by their arithmetic mean. Upper warning and upper control limits (UWL and UCL), which indicate questionable and unacceptable data quality, respectively, are set for this project at 50 and 100 percent, except for values which are close to the reporting limit, where greater variability in analytical results is normally encountered. RPD values for analyses of duplicate samples indicate good data precision in samples collected in the October sampling round as shown in Table 2. None of the RPD values for the October analytical data exceed the UCL or the UWL.

Field (bailer) blank samples were collected prior to sampling at well LF-2 as a QA check on field decontamination procedures; this sample was submitted to Brown and Caldwell for analysis using EPA Methods 8015 and 8020. Chemical constituents were not detected in the bailer blank samples.

7.0 CONCLUSIONS

The observed direction of ground-water flow at the Site in October was towards the south-southwest. The detection of trace amounts of xylene (0.0016 ppm) in well LF-4 appears to indicate that xylene previously detected in further upgradient well LF-2 may be migrating towards LF-4. The detection, for the first time, of ethylbenzene (0.023 ppm) and chlorobenzene (0.0095 ppm) in well LF-2, in conjunction with the fact that TPH as gasoline, and xylene (both previously detected at well LF-2) were not detected during the October sampling, indicate that the chemical constituents in ground water at this location may be changing. Further sampling scheduled for January 1990 will further evaluate this situation.

Maximum contaminant levels (MCLs) for BTEX compounds in ground water, as outlined in the California Regional Water Quality Control Board Central Valley Region report titled "Staff Report: The Designated Level Methodology for Waste Classification and Cleanup Level Determination," dated October 1986, and prepared by Jon B. Marshack, are as follows:

benzene:	0.005 ppm (primary EPA MCL)
toluene:	2 ppm (MCL goal - EPA)
ethylbenzene:	0.680 ppm (MCL goal - EPA)
xylene:	0.440 ppm (MCL goal - EPA)
chlorobenzene:	0.060 ppm (MCL goal - EPA)

Concentrations of the above referenced compounds in ground water at the site were below these MCLs with the exception of benzene at well LF-2. The concentration of benzene at this location has, however, decreased from the initial detection concentration of 0.870 ppm in March of 1989, to 0.017 in May of 1989, and was detected at 0.020/0.016 ppm in October 1989. This indicates that concentrations of benzene in ground water may be decreasing with time. Continued monitoring will aid in further evaluating this apparent pattern.

8.0 RECOMMENDATIONS

As indicated by Levine·Fricke's July 27, 1989 report ("Soil and Ground-Water Investigation, 3300 Webster Street, Oakland, California"), the areas of petroleum-affected soil and ground water appear to be limited to the immediate area between borings and wells SB-12, B-2, LF-3, and LF-4 (refer to Figure 1). Assuming a conservative date of leakage at the tank(s) to have been at the time of removal (September 1973), at least 15 years have passed since that time, and the limits of affected ground water apparently extend no more than 35 feet from the suspected source, as suggested by the detection of only trace concentrations of xylene at downgradient well LF-4. Since the highest concentrations of gasoline in both soil and ground water would have been expected to have been the highest soon after the tank leak occurred, Levine·Fricke expects that total concentrations of these compounds will continue to decrease over time through the processes of natural degradation, adsorption, volatilization, and dilution.

Based upon results obtained from the Site to date, Levine·Fricke recommends the following two possible programs for sampling frequency for the next several years, depending on observed ground-water flow and quality at the Site.

In the first case, if ground-water quality and ground-water flow directions remain at or decrease from the concentrations and direction as presently observed for the first full year of quarterly monitoring, Levine·Fricke would recommend decreasing the frequency of monitoring from quarterly to bi-annually (every six months). If further monitoring during the ensuing 24-month period indicated no significant adverse changes in water quality or flow directions as stated above, then we would recommend decreasing the monitoring to an annual sampling schedule. In the event that the detection of petroleum compounds was observed to be below MCL concentrations for an extended period of time during the monitoring (12 months), we would recommend that monitoring be discontinued.

In the second case, in the event that ground-water monitoring during the first full year of quarterly monitoring indicated that petroleum compound concentrations in ground water of any of the on-site wells increased relative to regulatory guidelines in effect at the time of sampling, then we would recommend continuing the present quarterly monitoring schedule until decreases or stability in detected concentrations are observed, at which time monitoring would be recommended to gradually decrease as outlined above. Additionally, if increases in concentrations are significant, remedial actions will be proposed.

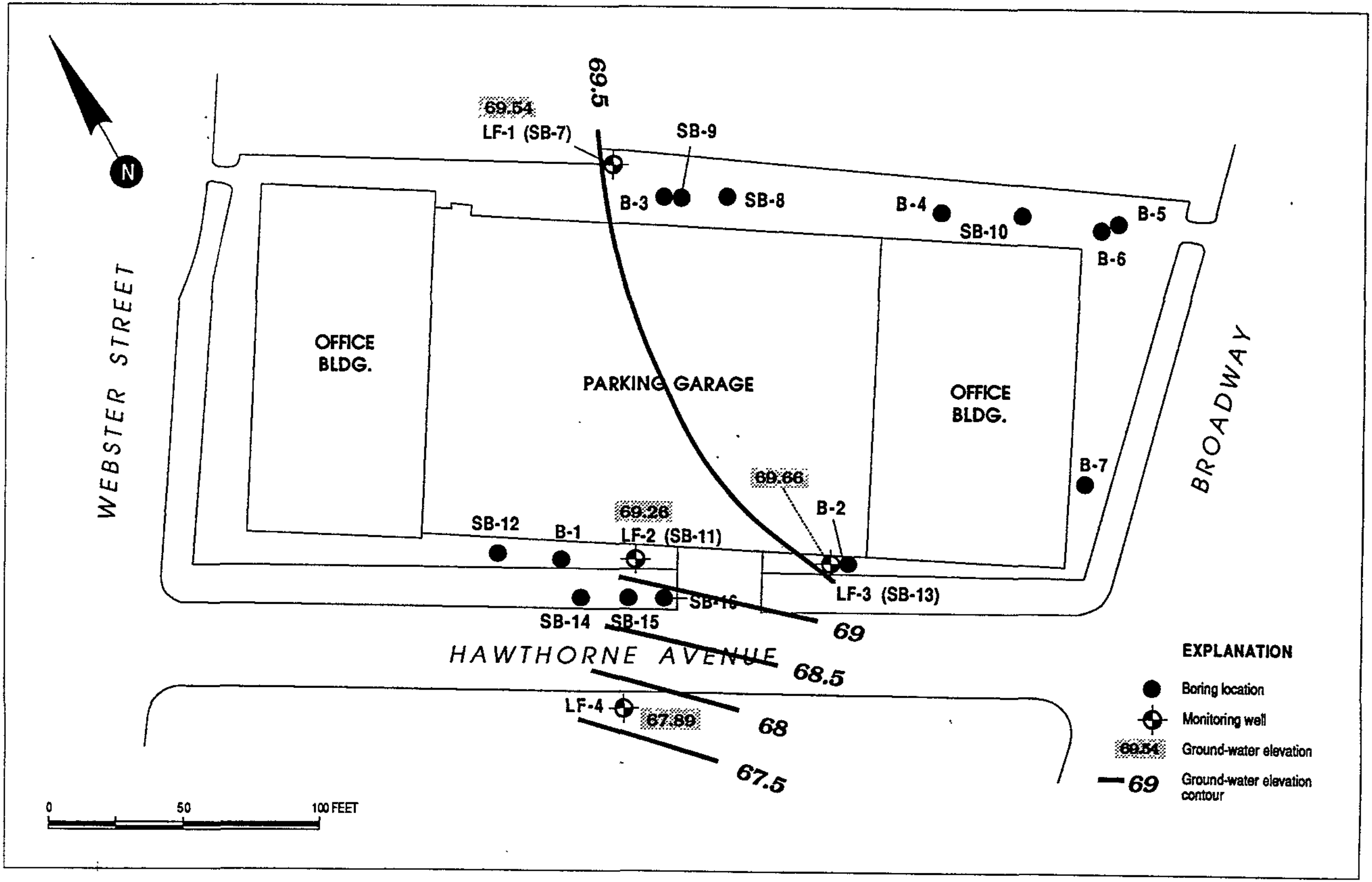

Figure 2 : CONTOURED GROUND-WATER ELEVATIONS, OCTOBER 4, 1989

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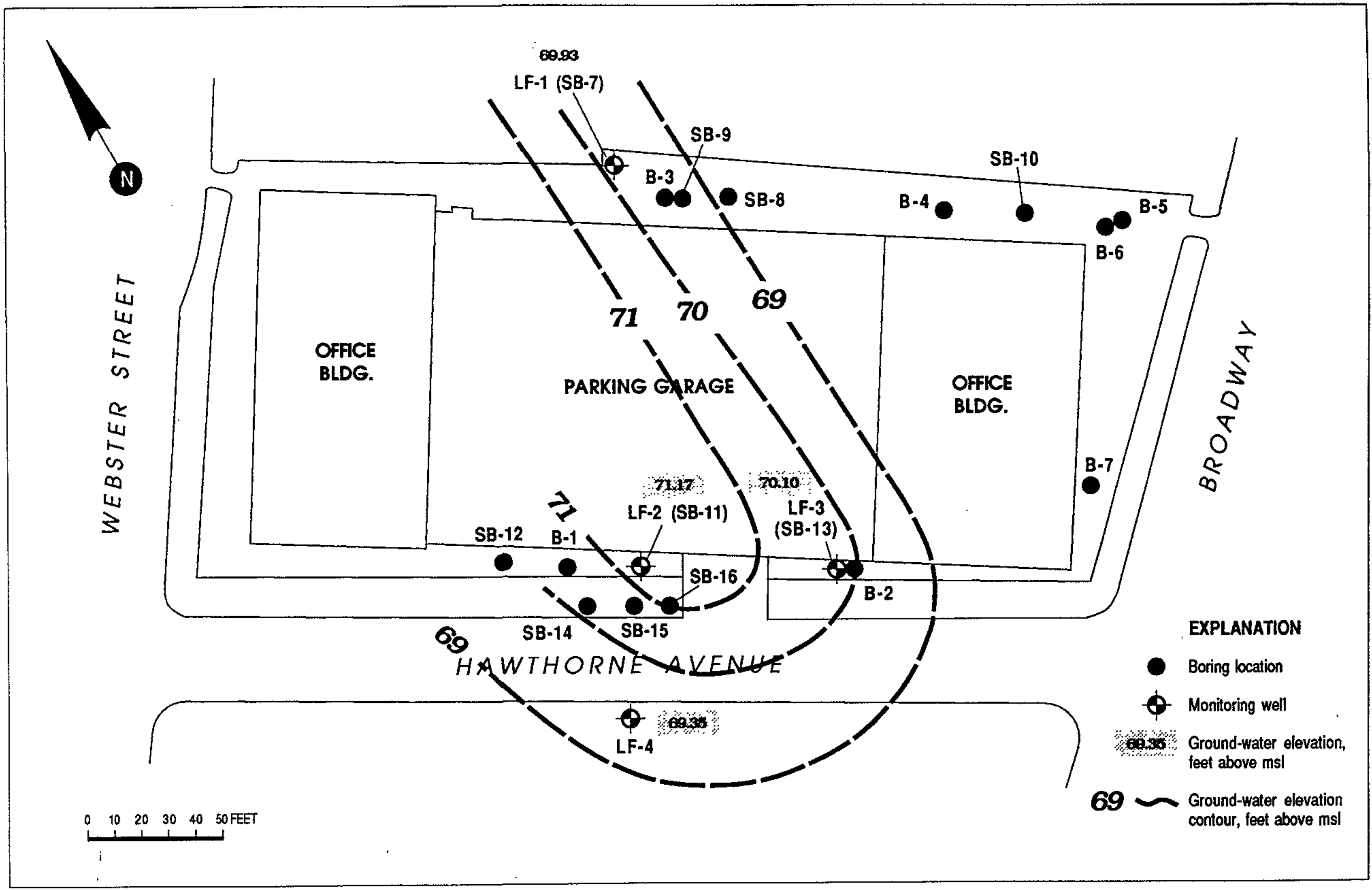

Figure 3 : CONTOURED GROUND-WATER ELEVATIONS, JULY 2, 1990

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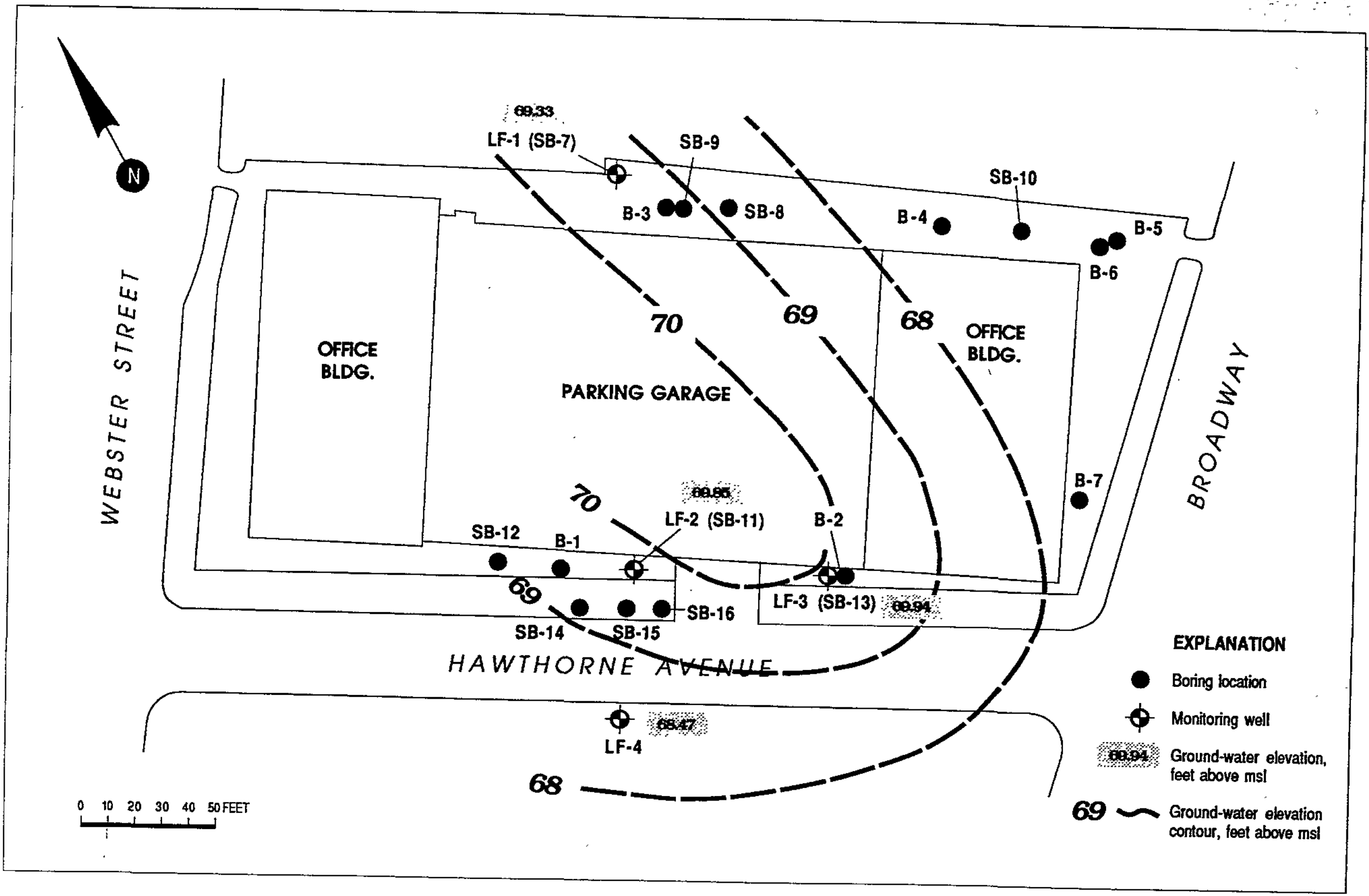

Figure 2 : CONTOURED GROUND-WATER ELEVATIONS, OCTOBER 3, 1990

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