Work Plan for Additional
Soil and Groundwater Investigations
Rifkin Property
4525 to 4563 Horton Street
Emeryville, California

November 20, 1996
LF 3042.95-004

Prepared for
The Sherwin-Williams Company
101 Prospect Avenue
Cleveland, Ohio 44115

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INTRODUCTION

This work plan is submitted per Sherwin-Williams' request for additional investigations of soil and groundwater at the Rifkin Property, located at 4525 to 4563 Horton Street in Emeryville, California. It describes the proposed scope of work for conducting these additional investigations at the Rifkin Property.

One of the goals of the work plan is to obtain necessary data to allow Chiron to move promptly forward with their building demolition. As a result, the work may be conducted in phases, with sampling in the southern area of the property taking highest priority before building demolition. In addition, physical building constraints may require that some of the work be conducted after building demolition. The schedule for drilling and sampling will be worked out with Chiron after approval of the scope of work.

OBJECTIVES

The primary objectives of the activities described in this work plan are to:

- conduct a visual analysis of the property, assess past industrial activities and review data from previous investigations in order to identify potential source areas for soil and groundwater contamination (Task already completed)
- verify the extent of the arsenic groundwater plume from the Sherwin-Williams property including assessment of whether arsenic is migrating in sand stringers beneath the currently installed wells RP-1 - RP-5
- confirm locations of other sources of contamination through selective sampling of soil and groundwater in order to fill in data gaps and/or confirm results from previous investigations
- define the extent of chemical migration in the vadose zone soil from the Sherwin-Williams property onto the Rifkin property at the southern Sherwin-Williams /Rifkin property boundary in order to determine whether soil removal is appropriate and, if so, to what extent
- collect groundwater samples in wells upgradient from Rifkin and downgradient from the South BGR property (former Shell development property) to verify the extent of contaminated groundwater migration from the South BGR property onto the Rifkin property

SCOPE OF WORK

Based upon the objectives listed above, the proposed scope of work includes the following tasks:

- Task 1: Site Walk and Review of Historical Data
- Task 2: Pre-Field Work Activities
- Task 3: CPT Borings
- Task 4: Soil and Groundwater Sampling at CPT Boring Locations
- Task 5: Soil Sampling in the Vicinity of the Southern Sherwin-Williams/Rifkin Property boundary
- Task 6: Installation, Development, and Sampling of Monitoring Wells
- Task 7: Report Preparation

Detailed descriptions of the services to be provided under each work task are presented below.

Task 1: Site Walk and Review of Historical Data

A review of historical reports and data for the Site has been conducted as part of Task 1 to evaluate past site usage, subsurface lithology and soil and groundwater quality at the Site. A significant number of site investigations and reports have been conducted at Rifkin including, but not limited to, reports by ES Engineering-Science, Harding Lawson Associates, TMC Environmental, Erler and Kalinowski and Levine·Fricke·Recon Inc. (LFR; formerly Levine·Fricke and Recon Environmental). Review of the information from these reports was used to select tentative soil and groundwater sampling locations as proposed in Tasks 3, 4, and 5, and shown in Figure 1 of this work plan.

After reviewing the historical data for the Site, a thorough site inspection was conducted by LFR personnel on September 9, 1996. The purpose of the Site inspection was to:

- observe general Site features
- identify evidence of current and past on-site use, storage, handling, discharge, and disposal of potentially hazardous substances
- assess visible evidence of where possible release(s) of hazardous substances to the environment may have occurred
- identify physical constraints with respect to installing CPT borings and collecting soil and groundwater samples
- survey locations where future drilling will be expected in order to locate these points, either before or after demolition of the building has occurred

During the visual inspection, evidence of potential hazardous material releases (i.e., staining, stored materials, drainage sumps, etc.) was identified, which appear to have caused shallow foundation and soil impacts. Based on the site inspection, it was

determined that sampling of shallow soil or foundation materials will be conducted and the samples will be analyzed for the constituents listed under Task 4.

Task 2: Pre-Field Work Activities

The appropriate permits will be obtained from the City of Emeryville and from Alameda County Flood Control and Water Conservation District (Zone 7) before subsurface investigations and monitoring well installation activities begin. These permits would include any well drilling permits, as well as access right-of-way for drilling in Horton Street or the adjacent sidewalk.

A private underground utility locator will identify the locations of subsurface structures and utility lines at each proposed CPT and monitoring well location before subsurface investigation activities commence. Underground Services Alert (USA) also will be notified before initiation of subsurface investigations and well installation activities, so that the locations of public utilities can be identified.

Task 3: CPT Borings

An estimated 20 CPT borings will be drilled at the Rifkin Property under the supervision of a LFR geologist where deemed necessary. Five of the CPT borings will be drilled in the vicinity of the southern Sherwin-Williams/Rifkin property boundary. Each of these five CPT borings will be drilled at approximately 13 feet to the north of the southern Sherwin-Williams/Rifkin property boundary and will be spaced at approximately 40 foot intervals in an east-west direction. The number and locations of the remaining CPT borings will be determined based on the site data review and visual inspection conducted under Task 1. Based on preliminary review of the site data, LFR has tentatively identified these locations, as shown in Figure 1. The data collected from the five CPT borings in the vicinity of the southern Sherwin-Williams/Rifkin property boundary and from the remaining CPT borings will be used to select discrete intervals in the subsurface to collect soil and groundwater samples as described in Task 4.

CPT provides identification of lithologic units, using an instrumented probe with a conical tip and friction sleeve, to measure various geologic, geotechnical, and hydrologic parameters. This is accomplished by correlating resistance on the cone tip, frictional resistance along the cylindrical friction sleeve, probe inclination, and pore water pressure. The data generated from the CPT measurements will be used to identify changes in subsurface lithology and aid in assessing potential intervals in the subsurface for the collection of soil and groundwater samples.

The CPT probe, which is attached to a string of steel pipe segments, will be pushed into the ground using a truck-mounted hydraulic ram with a maximum reaction of 25 tons. The probe will be advanced at an approximate rate of 2 centimeters per second, while measurements are recorded continuously and relayed directly to an on-board computer. Lithologic and hydrologic data based on cone tip resistance, sleeve friction,

probe inclination, and pore water pressure measured by the cone-tipped probe are printed out by the computer as the probe advances. Upon completion, the CPT boring will be grouted through a tremie pipe immediately after the probe is removed from the ground.

Drilling all the CPT borings prior to building demolition may not be feasible due to physical building constraints. As a result, LFR will attempt to drill as many CPT borings as feasible prior to building demolition, with the remaining drilling to be completed after demolition.

Task 4: Soil and Groundwater Sampling at CPT Boring Locations

The lithologic and hydrologic data will be reviewed after completion of the CPT borings, in order to determine discrete soil and groundwater sampling intervals at each CPT boring location.

Under the supervision of a LFR geologist, a hydraulically driven push-rod sampling rig will be used to collect a soil sample (if deemed necessary) at two different depths above the groundwater table at each CPT location. The boring location for the push-rod sampling rig will be within an approximate 1-foot radius of each CPT boring location.

At each boring location, following collection of the soil samples, a discrete groundwater sampling tool will be attached to the hydraulically driven push-rod sampling rig and groundwater samples will be collected from below the groundwater surface. At each boring location, two groundwater samples will be collected within the A-zone groundwater at the site. One of the groundwater samples will be collected between the top of the groundwater surface and 15 feet below ground surface (bgs); the other groundwater sample will be collected between 15 feet bgs and 25 feet bgs. Where appropriate, samples will be collected where sand stringers are identified in the boring.

Soil Sampling Field Methods

Boreholes will be advanced by hydraulically driving a 1-1/2 inch diameter core-rod, lined with brass tubes inside a 1-5/8 inch diameter hollow steel sampling tube. This sampling system allows soil samples to be collected from a selected interval. When the desired sampling depth is reached in each boring, the lowermost sample will be preserved by placing aluminum foil-lined plastic caps over the ends of the brass tubes; the samples will then be stored in a chilled cooler. Each sample will be labeled with the borehole identification and depth of the sample, the time and date of sample collection, the analysis requested, and the name of the individual who collected the sample.

The soil sample collected above for chemical analyses will be lithologically described using the Unified Soil Classification System. Lithologic descriptions will be recorded in the field on borehole log forms. Soil samples collected from the well borings for lithologic description will be field screened, using an organic vapor meter (OVM), for

the presence of VOCs. Additional soil samples will be collected for possible chemical analysis based on visible staining and/or high OVM measurements.

All downhole testing and sampling equipment will be decontaminated between locations using a steam cleaner.

Investigation derived soil waste will be placed in 55-gallon drums and stored on the Sherwin-Williams property. Selected soil samples will be composited and the TCLP will be determined for arsenic, lead, zinc, VOCs and SVOCs. An appropriate disposal site will be determined based on the analytical results.

Groundwater Sampling Field Methods

The 1-1/2 inch rods will be removed from the boring for collection of a groundwater sample, in order to obtain groundwater samples at a discrete depth. A discrete interval sampling tool will then be inserted and the 1-5/8-inch-diameter rods will be removed. The discrete groundwater sampling tool will then collect a groundwater sample in appropriate containers. Filled sample bottles will be labeled, stored on ice in a cooler, and submitted to the analytical laboratory. Chain-of-custody forms will accompany the shipment of samples. After sample collection, the completed boreholes will be backfilled to the ground surface with neat cement grout containing a maximum of 3 to 5 percent bentonite.

All downhole testing and sampling equipment will be decontaminated between locations using a steam cleaner.

Wastewater generated during steam cleaning and other activities will be discharged into the GWETS at Sherwin-Williams.

Laboratory Analysis

Soil and groundwater samples will be submitted to American Environmental Network of Pleasant Hill, a California-certified laboratory, for chemical analysis on a standard laboratory turnaround schedule of two weeks. Soil and groundwater samples will be analyzed for arsenic, lead, and zinc using EPA Method 6000/7000 series, SVOCs using EPA 8270, VOCs using EPA Method 8240, TPHg using EPA Method 5030 GCFID, TPHd using EPA Method 3510/3550, and for pH. Soil samples will also be analyzed for PCBs using EPA Method 8080. The groundwater samples will be filtered in the laboratory prior to all metals analyses.

Task 5: Soil Sampling in the Vicinity of the Southern Sherwin-Williams/Rifkin Property Boundary

Soil samples will be collected at ten locations in the vicinity of the southern Sherwin-Williams/Rifkin Property Boundary. Five of the locations will be at approximately

3 feet to the north of the southern Sherwin-Williams/Rifkin property boundary and will be spaced at approximate 40 foot intervals in an east-west direction. The other five locations will be at approximately 13 feet to the north of the southern Sherwin-Williams/Rifkin property boundary and will also be spaced at approximate 40 foot intervals in an east-west direction. The five borings furthest to the north, as described immediately above (Task 5), are the same borings as previously described in Task 4 (the five CPT boring and soil sample locations 13 feet to the north of the southern Sherwin-Williams/Rifkin property boundary). Under Task 5, additional soil samples will be collected in these borings, based upon the soil sampling protocol described below.

Under the supervision of a LFR geologist, a hydraulically driven push-rod sampling rig will be used to collect a soil sample at 2.5 feet bgs, 5.0 feet bgs, and either 7.5 feet bgs or within six inches above the first encountered groundwater. Soil sampling field methods will be the same as previously described in Task 4.

Laboratory Analysis

Soil samples will be submitted to American Environmental Network of Pleasant Hill, a California-certified laboratory, for chemical analysis on a standard laboratory turnaround schedule of two weeks. Soil samples will be analyzed for arsenic, lead, and zinc using EPA Method 6000/7000 series, VOCs using EPA Method 8240, SVOCs using EPA Method 8270, and for pH.

In addition, soil samples at the same depths for each line of five borings along the property boundary will be composited at the same depth. For example, all the soil samples at 2.5 feet bgs for the borings 3 feet out from the property boundary will be composited. The TCLP for all of the composited samples will be determined for arsenic, lead, zinc, VOCs and SVOCs. This data will provide information for selection of a landfill in the event that any soils will have to be excavated from the Rifkin site.

Task 6: Installation, Development, and Sampling of Monitoring Wells

Installation of Monitoring Wells

Four A-zone monitoring wells will be completed to a depth of 15 to 20 feet bgs at the locations shown on Figure 1. The locations of these monitoring wells may be adjusted based on the historical site data review under Task 1 and the CPT results under Task 4.

All wells will be installed by the hollow-stem auger drilling method. All augers and sampling equipment will be steam cleaned before use at each well location. Soil samples will be collected continuously, and will be used to characterize the subsurface lithology. Soil samples and drill cuttings will be monitored with an organic vapor meter (OVM) to test for the presence of volatile organic compounds (VOCs) in the soil for health and safety purposes.

Monitoring wells will be completed with 2-inch diameter polyvinyl chloride (PVC) casing in an 8-inch diameter borehole, with a maximum of 10 feet of slotted screen

After the well casing has been placed in the completed borehole, the well annulus opposite the perforated interval will be backfilled with clean sand to a height of approximately 2 feet above the top of the perforations. The grain-size distribution of the sand pack will be selected to be compatible with the selected slot size of the well screen. Approximately 2 feet of bentonite pellets will be placed above the sand pack to isolate the perforated interval from material above and inhibit the entrance of grout into the sand pack. A cement-bentonite grout will be placed in the remainder of the borehole. A locking cover will then be placed over the top of the casing to protect the integrity of the well.

Soil cuttings generated during drilling will be stored in 55-gallon drums and left on site until an appropriate disposal method is determined pending analytical results.

Top-of-casing measurements and horizontal location for the new wells will be collected by a licensed surveyor.

Development and Sampling of Monitoring Wells

Collection of water-level measurements and development of the newly-installed wells will take place following installation.

The groundwater level measurements will be measured from the top of the casing to the groundwater surface using an electronic water-level probe attached to a measuring tape graduated to 0.01 foot intervals.

The newly installed wells will be developed by bailing, swabbing, and pumping to remove sediment from around the well and to enhance hydraulic communication with the surrounding formation.

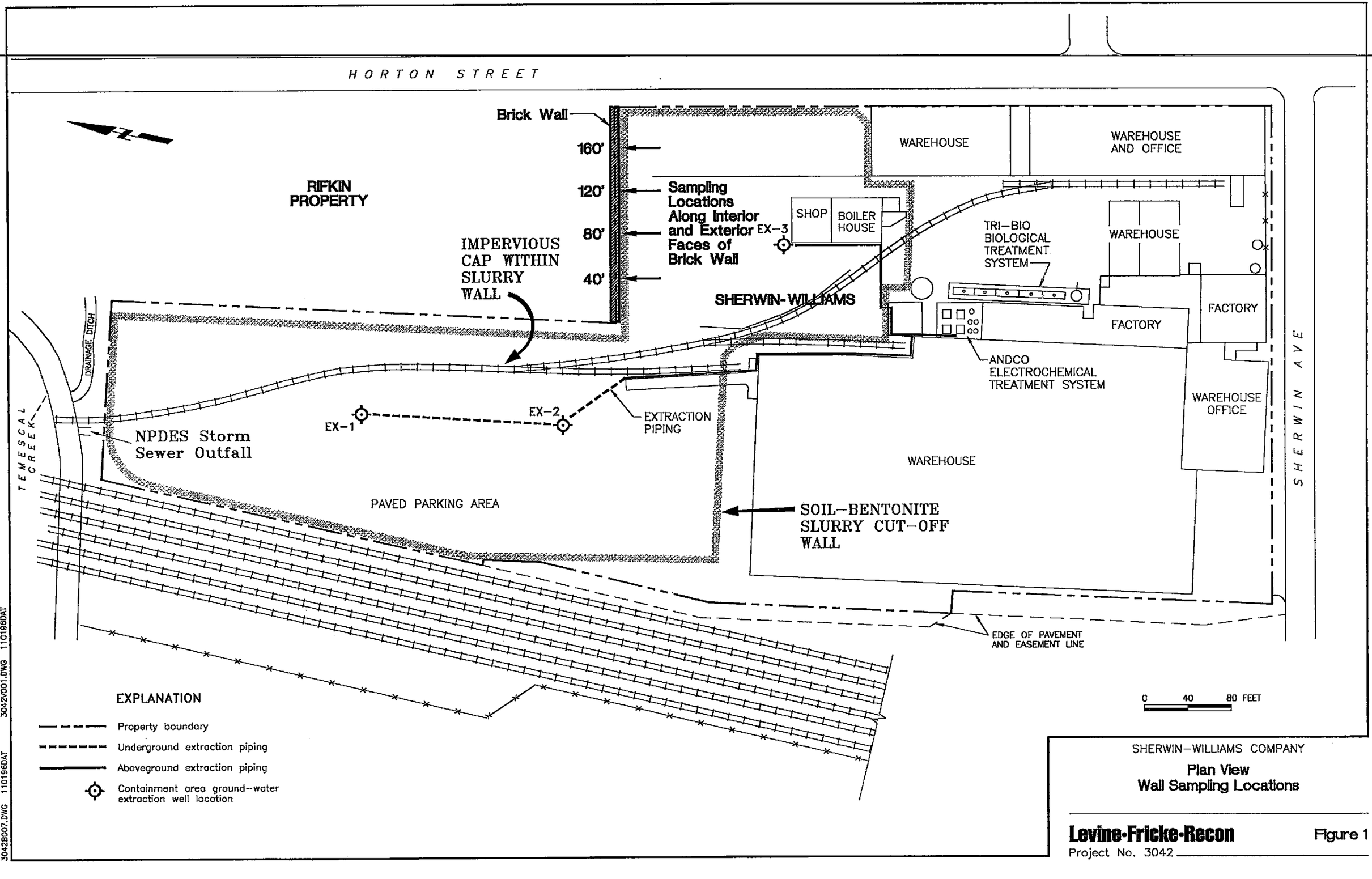
During well development, approximately 10 well volumes of water will be removed from each well. Specific conductance, pH, and temperature will be measured during this purging process to aid in evaluation of groundwater quality. Observations concerning quantity and clarity of water withdrawn will be recorded during this process. After well development, the water level in the well will be measured. All developing and sampling equipment will be steam cleaned before use at each well.

Groundwater samples will be collected from the new wells and submitted to American Environmental Network for analysis of arsenic using EPA Method 6000/7000 series, VOCs using EPA Method 8240, TPHg using EPA Method 5030 GCFID, TPHd using EPA Method 3510/3550, and SVOCs using EPA 8270.

Groundwater generated from the well development and sampling activities will be discharged to the Sherwin-Williams GWETS.

Task 7: Data Report Preparation

A data report will be prepared summarizing investigation activities. The report will include a description of site activities conducted, results of chemical analysis (foundation materials, soil, and groundwater) presented in tabular form, site maps showing concentrations of chemicals detected in foundation materials, soil and groundwater, data collected during CPT activities, lithologic logs prepared during soil and groundwater sampling activities, and laboratory data reports.



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Plan View
Wall Sampling Locations

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Figure 1

Project No. 3042