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By Alameda County Environmental Health at 4:05 pm, Jan 03, 2013

Ms. Barbara Jakub, P.G.
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Grit Auto Repair and Service, 1970 Seminary Boulevard, Oakland, California
(Fuel Leak Case No. RO0000413)

Dear Ms. Jakub:

Stratus Environmental, Inc. (Stratus) has prepared this report titled *Supplement to Feasibility Study/Corrective Action Plan* on my behalf. The report was prepared in regards to Alameda County Fuel Leak Case No. RO0000413, for the former Grit Auto Repair and Service, 1970 Seminary Boulevard, Oakland, California.

I have reviewed a copy of this report, sent to me by representatives of Stratus, and "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report are true and correct to the best of my knowledge".

If you have any questions, please contact me via electronic mail at peggy.h.garcia@sbcglobal.net, or my daughter Angel LaMarca at angelcpt@gmail.com.

Sincerely,

A handwritten signature in blue ink, appearing to read "Peggy Garcia Trustee". The signature is written in a cursive style.

Ms. Peggy Garcia, Trustee, Grit Family Trust

cc: Angel LaMarca



3330 Cameron Park Drive, Ste 550
Cameron Park, California 95682
(530) 676-6004 ~ Fax: (530) 676-6005

December 31, 2012
Project No. 2090-1970-01

Ms. Barbara Jakub, P.G.
Alameda County Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(via GeoTracker & Alameda County FTP site)

Re: Supplement to Feasibility Study/Corrective Action Plan
Former Gruit Auto Repair and Service
1970 Seminary Avenue
Oakland, California
(Fuel Leak Case No. RO0000413)

Dear Ms. Jakub:

Stratus Environmental, Inc. (Stratus) has prepared this *Supplement to Feasibility Study/Corrective Action Plan* (FS/CAP Supplement), on behalf of the Gruit Family Trust, for the Former Gruit Auto Repair and Service facility (the Site), located at 1970 Seminary Avenue, Oakland, California (see Figures 1 and 2). Alameda County Environmental Health Department (ACEHD) currently oversees an environmental case at the subject property relating to the presence of petroleum hydrocarbons and volatile organic compounds (VOCs). At the request of ACEHD, Stratus prepared an FS/CAP document for the site, dated August 8, 2012, which discussed the feasibility and cost effectiveness of remediating contaminants at the site above approximately 35 feet below ground surface (bgs), which includes the vadose zone and the 'upper water bearing zone'. Based on our evaluation of site conditions, Stratus recommended implementing remedial efforts in two phases; initially temporary dual phase extraction (DPE) would be completed in order to target removal of petroleum hydrocarbon mass from the subsurface. Once contaminant mass was reduced using DPE, ozone injection (OI) would be utilized in order reduce concentrations of contaminants in groundwater to levels that would allow for eventual closure of the site's environmental case.

After reviewing the FS/CAP, ACEHD prepared a letter, dated October 12, 2012, requesting additional information to enable the agency to complete their review of the FS/CAP. This document has been prepared in order to provide specific information requested in the October 2012 ACEHD letter. In the following subsections of this document, information requested by ACEHD is specified (in italicized text), and a discussion regarding ACEHD's concerns is provided.

Stratus recommended performing DPE using a network of 6 onsite extraction wells, with the extraction well locations designed with an assumed DPE radius of influence (ROI) of 20 feet (see Figure 3A). ACEHD stated that the borings and soil vapor points with the maximum tetrachloroethene (PCE) contamination are located approximately 15 to 20 feet away from the extraction wells. While understanding the space constraints of the property, ACEHD expressed their concern that the well spacing is not close enough to remediate these farther points with the highest concentrations. Please reevaluate the spacing or explain why this spacing is appropriate.

Given the available data, most of the contaminant mass that is expected to be removed from the shallow subsurface by DPE will be petroleum hydrocarbons. In order to alleviate ACEHD's concerns regarding ROI coverage, Stratus has prepared an alternate map (Figure 3B) which proposes using 7 extraction wells, instead of 6 wells, to perform DPE. The well spacing illustrated on Figure 3B would provide additional coverage near the auto repair building at the site, where PCE has been noted in shallow soil vapor. It should be noted, however, that given the well layout presented in Figure 3B, a greater distance between extraction wells and the location where free product has been noted (near MW-1) will exist if these alternate well locations were selected. However, if the estimated 20-foot ROI is accurate (finding from 1997 pilot test), the areas with documented free product impact should be successfully mitigated using the extraction well layout illustrated on Figure 3B. Limited PCE was historically detected at boring DP-2A; however, given the estimated 20-foot ROI, this offsite area would likely be outside of the influenced area of remediation.

Please provide a discussion of the effectiveness of in-situ chemical oxidation (ISCO) on PCE degradation through ethane. ACEHD is concerned that degradation will stall at the vinyl chloride stage leaving a much more toxic chemical in place of PCE.

In the FS/CAP, Stratus discussed performing ISCO by OI in the upper water bearing interval. Figure 4 presents a depiction of PCE concentrations in shallow groundwater using data collected from the site monitoring well network during the third quarter 2012. Figure 4 also includes offsite groundwater analytical data collected from direct push soil borings advanced in January 2012. The data illustrates that PCE impact to the upper water bearing interval is negligible, as no PCE was detected in any of the monitoring well samples collected during the most recent well sampling event (third quarter 2012). In addition, PCE was detected in only 1 of 12 offsite geoprobe boring samples. Given the very limited quantity of PCE within the upper water bearing zone, we believe that the benefits associated with using OI at the site far outweigh any potential negative aspects.

Figure 5 presents a flowchart that includes daughter products associated with the degradation of PCE over time. Figure 7 presents a summary of VOCs that were detected in groundwater at the site during the recent third quarter 2012 well sampling event. Data

from the well samples indicate that some of the PCE degradation products (including vinyl chloride up to 250 micrograms per liter [$\mu\text{g/L}$]) are already present at the site. The absence of PCE in shallow groundwater, and the presence of the daughter contaminants in select wells, suggests that the processes to degrade PCE have been ongoing at the site for some time.

During December 2011 soil gas sampling performed at the site, none of the PCE daughter products identified on Figure 5, in particular vinyl chloride, were detected during analytical testing. It is our opinion that the processes of degrading PCE to vinyl chloride appears to be already occurring, but not resulting in elevated vinyl chloride levels in shallow soil vapor. Upon implementation of OI, verification soil vapor sampling should be performed, using the existing soil vapor monitoring wells, to verify that vinyl chloride concentrations remain at acceptable levels in shallow soil vapor at the site. Assuming that this remains the case, we believe that the benefits associated with using OI far outweigh any potential negative aspects associated with injection of ozone at the site.

Stratus proposed performing OI primarily with the intention of mitigating petroleum hydrocarbon products. Figure 6 illustrates concentrations of petroleum hydrocarbons detected in groundwater during third quarter 2012 well sampling. It would be expected that after performing a DPE event at the site, concentrations of petroleum hydrocarbons will be lower than the levels indicated on Figure 6. However, in order to manage the site to closure, using DPE for only a limited period of time (due to relatively expensive operating costs), OI at the site could be warranted. The necessity of implementing OI should be re-evaluated once the DPE remedial work has been performed.

Before OI is performed, chromium samples should be collected from groundwater to determine if the addition of ozone will generate hexavalent chromium. If this potential is present, a contingency plan for hexavalent chromium should be prepared and submitted.

Prior to initiation of OI, a baseline groundwater sampling event would be performed. After OI was initiated, future sampling would be used to assess performance of remediation and the possibility of unacceptable hexavalent chromium levels in groundwater as a result of remedial efforts. Future data would be compared with Environmental Screening Levels (ESLs) established by the State of California to verify that hexavalent chromium concentrations in groundwater were acceptable.

In the event that hexavalent chromium concentrations in groundwater became problematic at the site, use of OI would be discontinued and replaced with oxygen injection through the same well network as a contingency. In addition, Stratus would discuss with ACEHD personnel the possibility of performing periodic groundwater extraction through the extraction wells, if necessary, in order to attempt to reduce hexavalent chromium concentrations to acceptable levels.

The depths of the vapor extraction and injection wells are not specified. Please present the well construction on your cross sections.

Stratus is proposing to install the extraction wells to approximately 33 feet bgs, with a screening interval of approximately 13 to 33 feet bgs. These well depths and screening intervals were selected based on an evaluation of historical analytical data and laser induced fluorescence (LIF) data collected during late 2011 subsurface investigation activities.

The exact depth and screening intervals of the ozone injection wells would be determined at the time of drilling, with soil sampling at each individual drilling location used in an evaluation of the well construction details. In general, our intention would be to situate the sparging interval of the injection wells within the coarsest grained strata possible, between about 26 and 33 feet bgs. Field screening of strata for petroleum products (by photo-ionization detector [PID]) would also be used to assist in the sparging interval determination, and if possible, injection of ozone could preferentially be completed within strata where elevated levels of petroleum hydrocarbons are observed. The proposed locations of the ozone injection wells are shown of Figure 8.

Two of the three geologic cross sections presented in the FS/CAP include data for the onsite area, where both OI and extraction wells were proposed. Figures 9 through 11 provide the requested information on the cross sections, or illustrate the surface traces for these sections. The proposed extraction and injection wells are included in the cross sections, with approximate screening intervals included on the figures, as appropriate.

CLOSING

We hope that the attached information is sufficient to allow for ACEHD personnel to complete their review of the August 8, 2012 FS/CAP, submitted on behalf of the subject property. In closing, Stratus would like to emphasize that while VOCs are documented in shallow soil and the uppermost water bearing zone at the site, most of the shallow contaminant mass at the site appears to be petroleum hydrocarbons related to a historical release of gasoline. The remedial approaches presented in the FS/CAP were selected for the primary purpose of remediating these gasoline leak related petroleum hydrocarbons, while also being compatible, in our opinion, to address the VOC impact to the subsurface.

LIMITATIONS

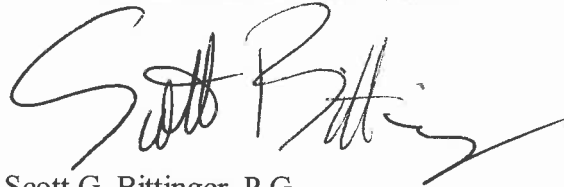
This report was prepared in general accordance with accepted standards of care that existed at the time this work was performed. No other warranty, expressed or implied, is made. Conclusions and recommendations are based on field observations and data obtained from this work and previous investigations. It should be recognized that definition and

evaluation of geologic conditions is a difficult and somewhat inexact science. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the subsurface conditions present. More extensive studies may be performed to reduce uncertainties. This report is solely for the use and information of our client unless otherwise noted.

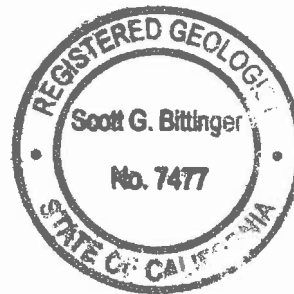
If you have any questions or comments concerning this report, please contact Scott Bittinger at (530) 676-2062.

Sincerely,

STRATUS ENVIRONMENTAL, INC.



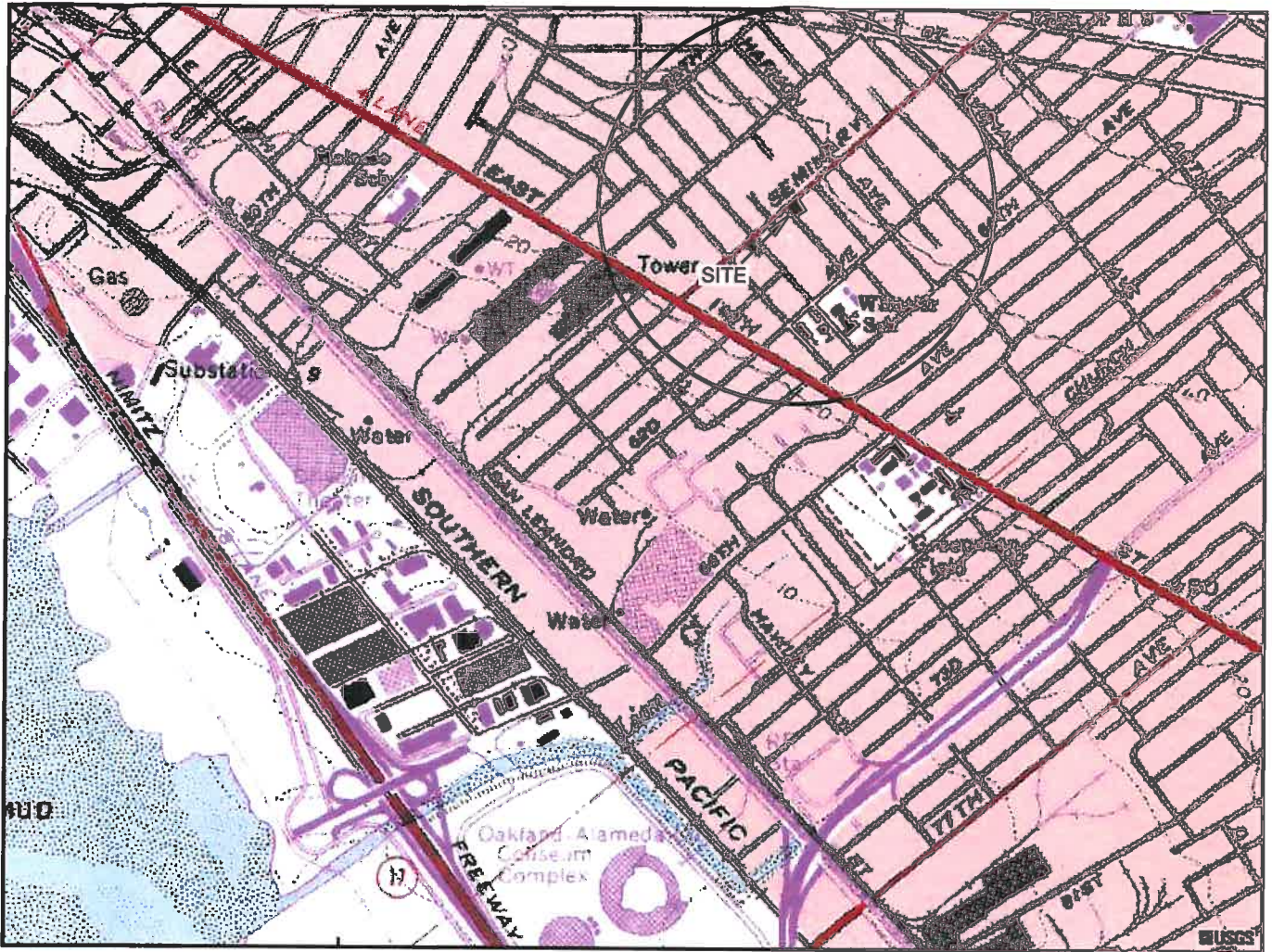
Scott G. Bittinger, P.G.
Project Manager



Attachments:

- | | |
|-----------|--|
| Figure 1 | Site Location Map |
| Figure 2 | Site Plan |
| Figure 3A | Hypothetical Layout of Temporary DPE System (as Proposed In the FS/CAP for Phase 1 of Remediation) |
| Figure 3B | Alternate Layout of Extraction Wells for Temporary DPE System |
| Figure 4 | PCE in Groundwater, Upper Water Bearing Interval |
| Figure 5 | Flowchart Illustrating Degradation Products of Chlorinated Hydrocarbons, Including PCE |
| Figure 6 | Petroleum Hydrocarbon Groundwater Analytical Summary, Third Quarter 2012 |
| Figure 7 | Halogenated VOC Groundwater Analytical Summary, Third Quarter 2012 |
| Figure 8 | Site Plan Depicting Proposed Extraction and Ozone Injection Well Locations |
| Figure 9 | Site Vicinity Map |
| Figure 10 | Geologic Cross Section A to A' |
| Figure 11 | Geologic Cross Section C to C' |

cc: Ms. Angel LaMarca and Ms. Peggy Garcia, Trustee, Gritit Family Trust



GENERAL NOTES:
 BASE MAP FROM U.S.G.S.
 OAKLAND, CA.
 7.5 MINUTE TOPOGRAPHIC
 PHOTOREVISED 1996



APPROXIMATE SCALE



QUADRANGLE LOCATION

STRATUS
 ENVIRONMENTAL, INC.

FORMER GRIMIT AUTO
 1970 SEMINARY AVENUE
 OAKLAND, CALIFORNIA

FIGURE

1

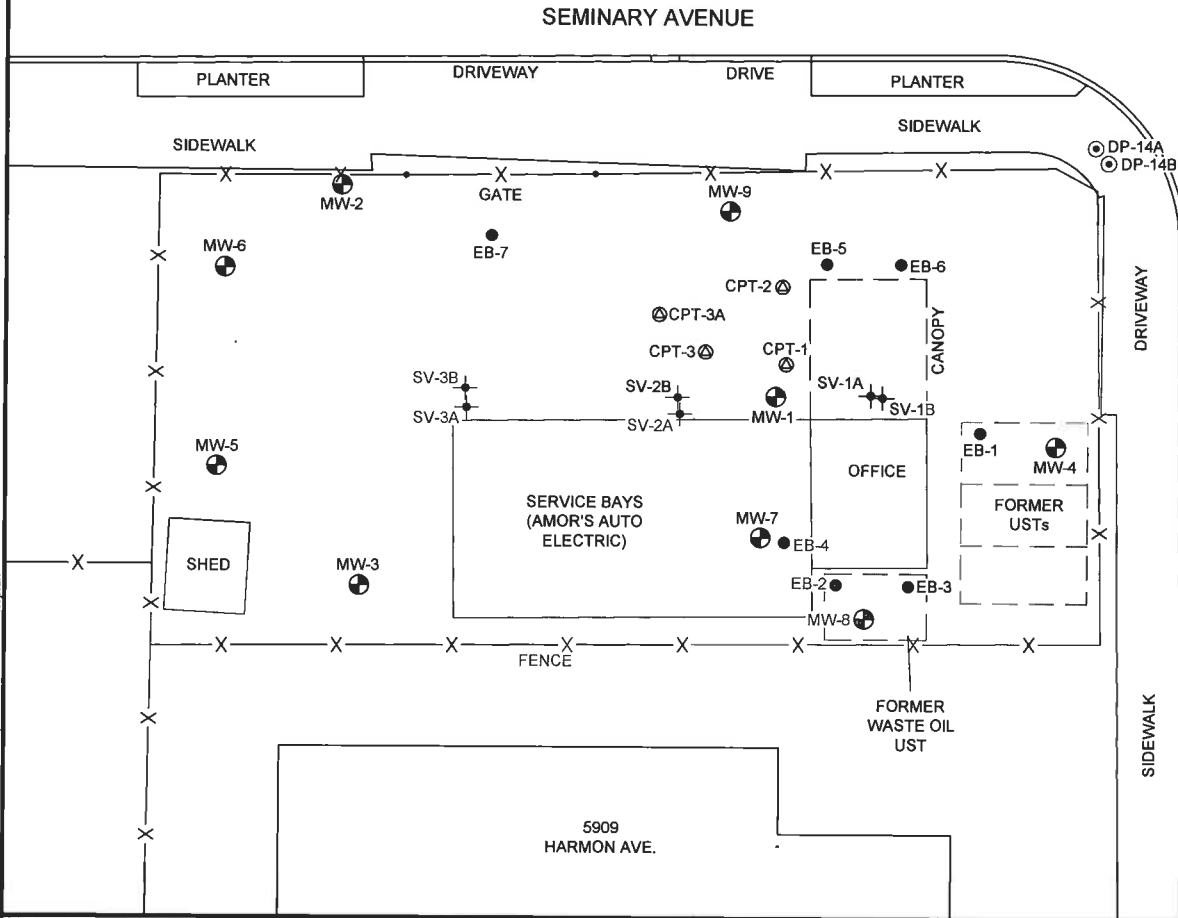
PROJECT NO.
 2090-1970-01

SITE LOCATION MAP



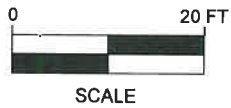
LEGEND

- ⊕ MW-1 GROUNDWATER MONITORING WELL LOCATION
- EB-1 APPROXIMATE EXPLORATORY BORING LOCATION
- ⊗ CPT-1 CPT/LIF BORING LOCATION
- ✦ SV-1A SOIL VAPOR SAMPLING WELL LOCATION
- ⊙ DP-14A DIRECT PUSH BORING LOCATION



JMP REV November 1, 2012 Grmrt NSiteplan Grmrt Auto

STRATUS
ENVIRONMENTAL, INC.



FORMER GRIMT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

SITE PLAN

FIGURE

2

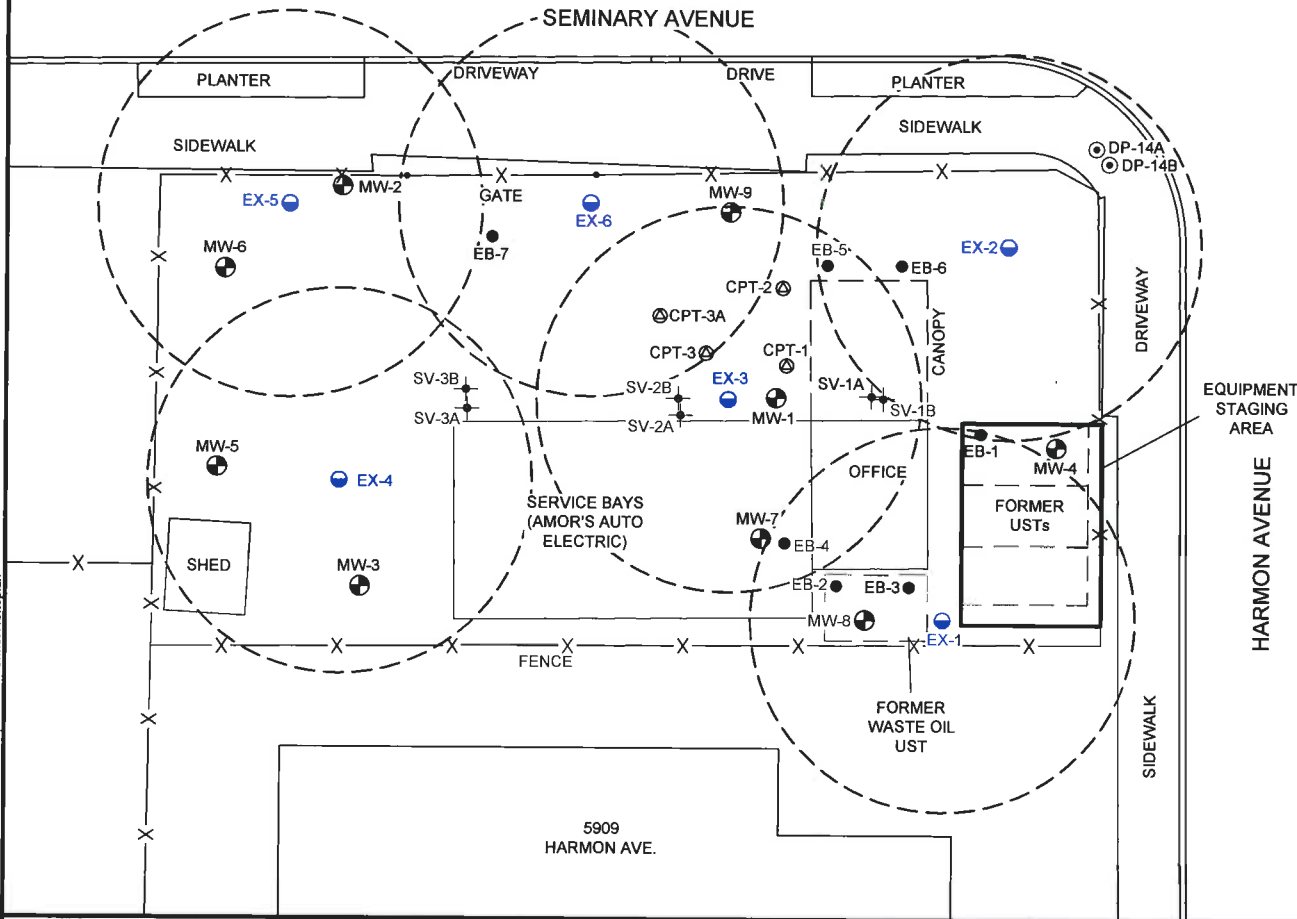
PROJECT NO.
2090-1970-1



LEGEND

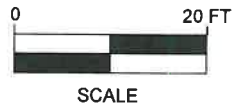
- MW-1 GROUNDWATER MONITORING WELL LOCATION
- EB-1 APPROXIMATE EXPLORATORY BORING LOCATION
- CPT-1 CPT/LIF BORING LOCATION
- SV-1A SOIL VAPOR SAMPLING WELL LOCATION
- DP-14A DIRECT PUSH BORING LOCATION
- EX-1 PROPOSED EXTRACTION WELL LOCATION
- ESTIMATED RADIUS OF INFLUENCE BASED ON FINDINGS OF 1997 TERRA VAC PILOT TEST

NOTE: CONVEYANCE PIPING WOULD BE SITUATED AT SURFACE GRADE



JMP REV November 1, 2012 Gmrt NSiteplan

STRATUS
ENVIRONMENTAL, INC.



FORMER GRIMIT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

HYPOTHETICAL LAYOUT OF TEMPORARY DPE
SYSTEM (PHASE 1 OF REMEDIATION)

FIGURE

3A

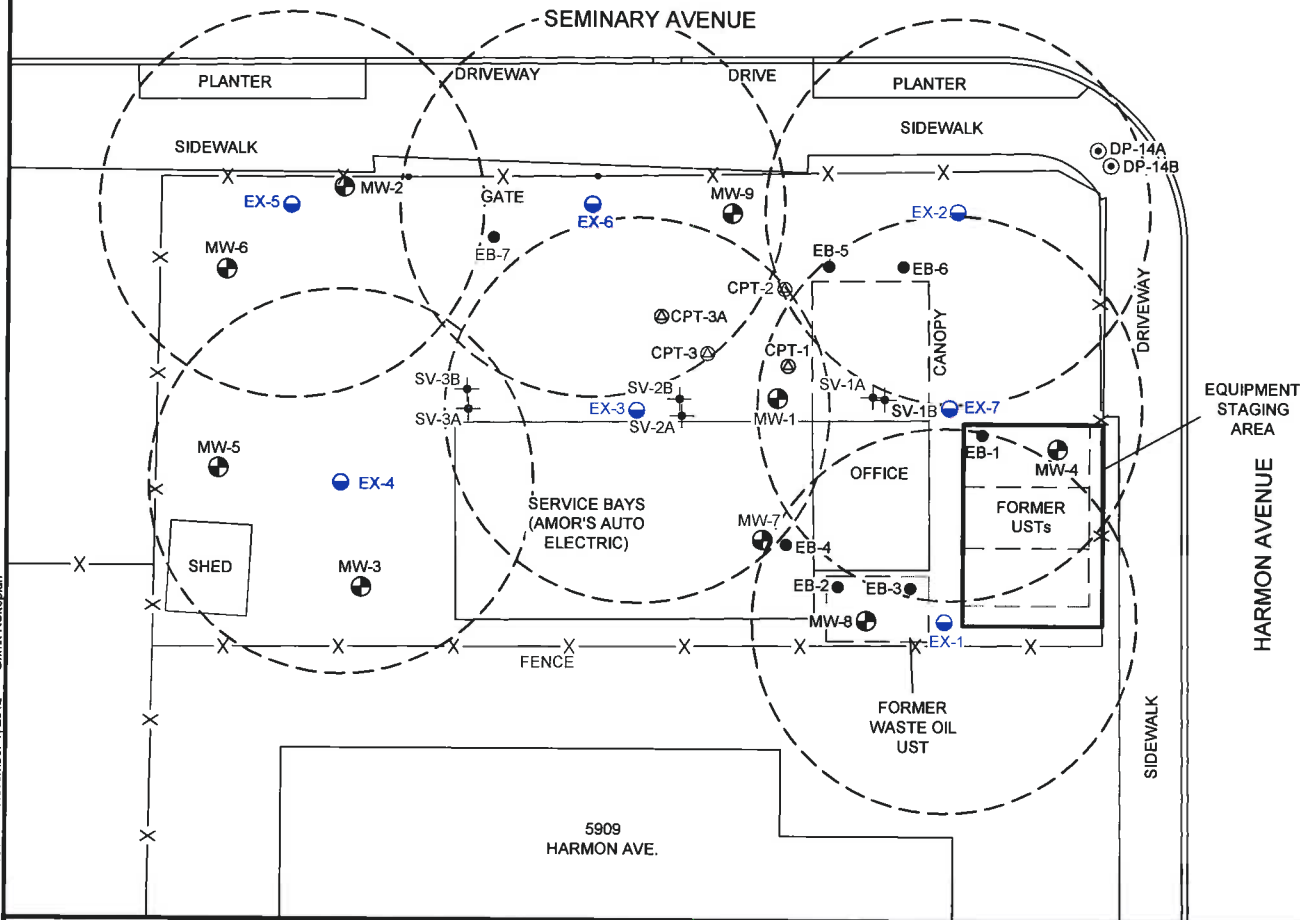
PROJECT NO.
2090-1970-1



LEGEND

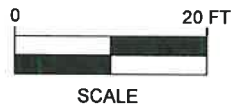
- MW-1 GROUNDWATER MONITORING WELL LOCATION
- EB-1 APPROXIMATE EXPLORATORY BORING LOCATION
- CPT-1 CPT/LIF BORING LOCATION
- SV-1A SOIL VAPOR SAMPLING WELL LOCATION
- DP-14A DIRECT PUSH BORING LOCATION
- EX-1 PROPOSED EXTRACTION WELL LOCATION
- ESTIMATED RADIUS OF INFLUENCE BASED ON FINDINGS OF 1997 TERRA VAC PILOT TEST

NOTE: CONVEYANCE PIPING WOULD BE SITUATED AT SURFACE GRADE



Grimt Auto/CAP REV November 1, 2012 Grimt NSiteplan JMP

STRATUS
ENVIRONMENTAL, INC.



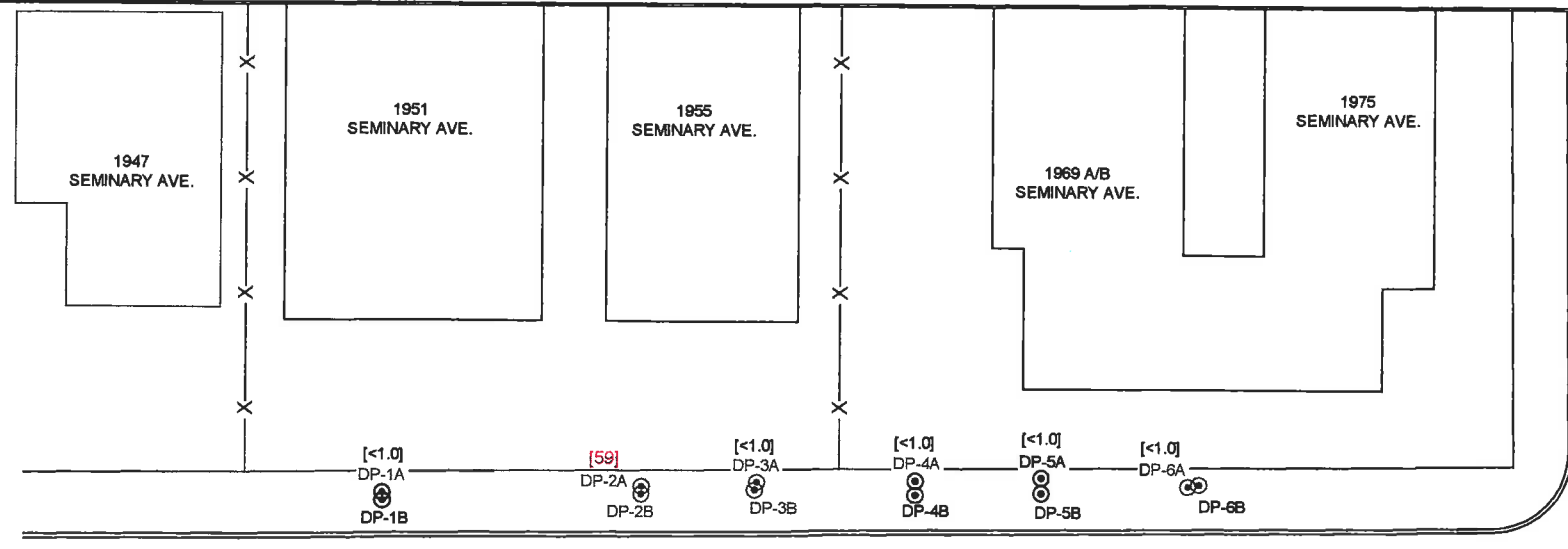
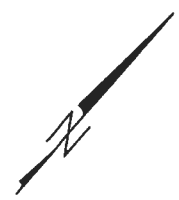
FORMER GRIMT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

ALTERNATE LAYOUT OF EXTRACTION WELLS FOR
TEMPORARY DPE SYSTEM

FIGURE

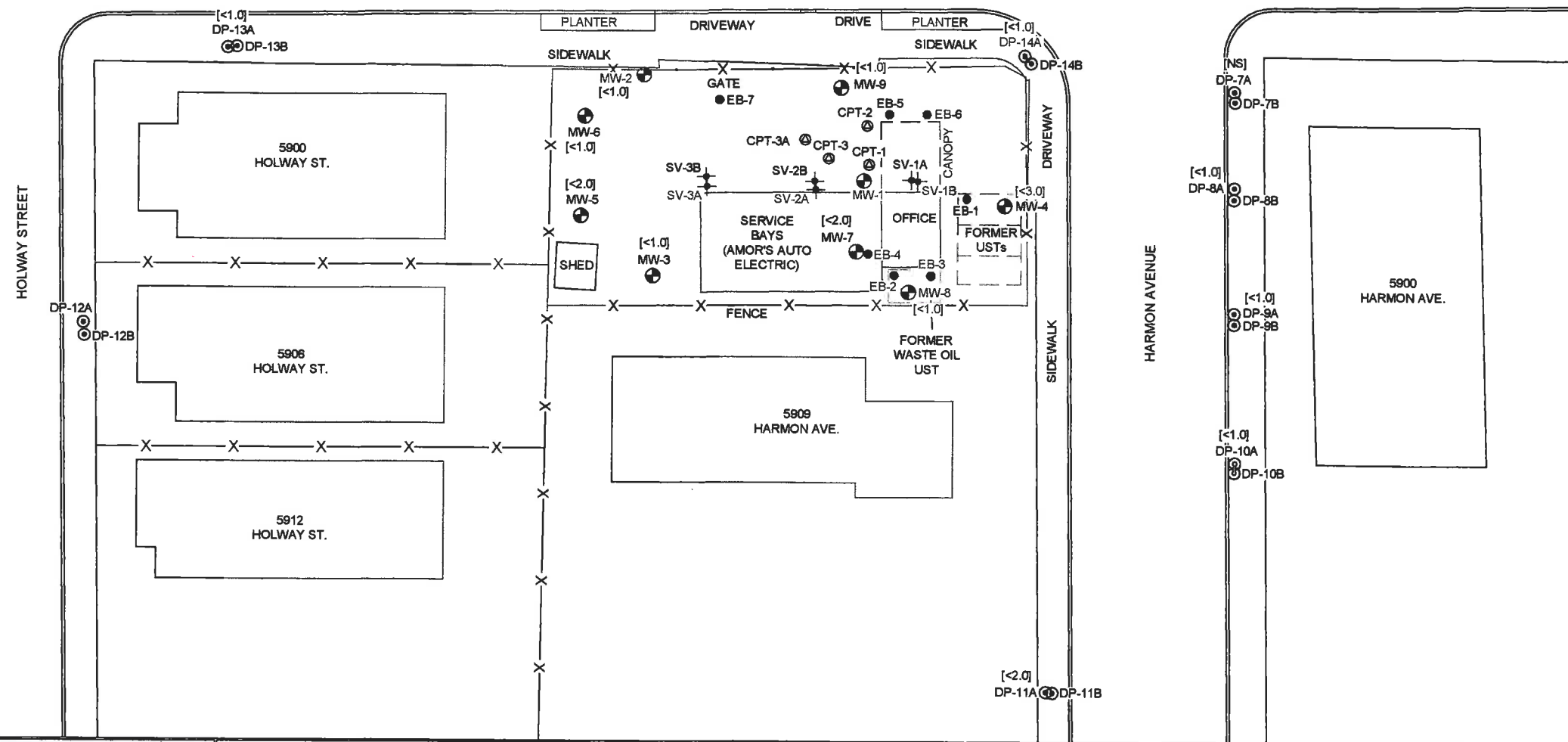
3B

PROJECT NO.
2090-1970-1



- LEGEND**
- ⊕ MW-1 GROUNDWATER MONITORING WELL LOCATION
 - EB-1 APPROXIMATE EXPLORATORY BORING LOCATION
 - ⊕ CPT-1 CPT/LIF BORING LOCATION
 - ✦ SV-1A SOIL VAPOR SAMPLING WELL LOCATION
 - ⊕ DP-1A DIRECT PUSH BORING LOCATION
- [<1.0] TETRACHLOROETHENE (PCE) IN µg/L
PCE ANALYZED BY EPA METHOD 8260B
SAMPLES COLLECTED IN JANUARY 2012
[NS] = SAMPLE ATTEMPT FAILED

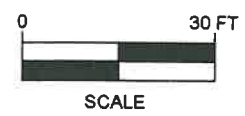
SEMINARY AVENUE



HOLWAY STREET

HARMON AVENUE

STRATUS
ENVIRONMENTAL, INC.



FORMER GRITIT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

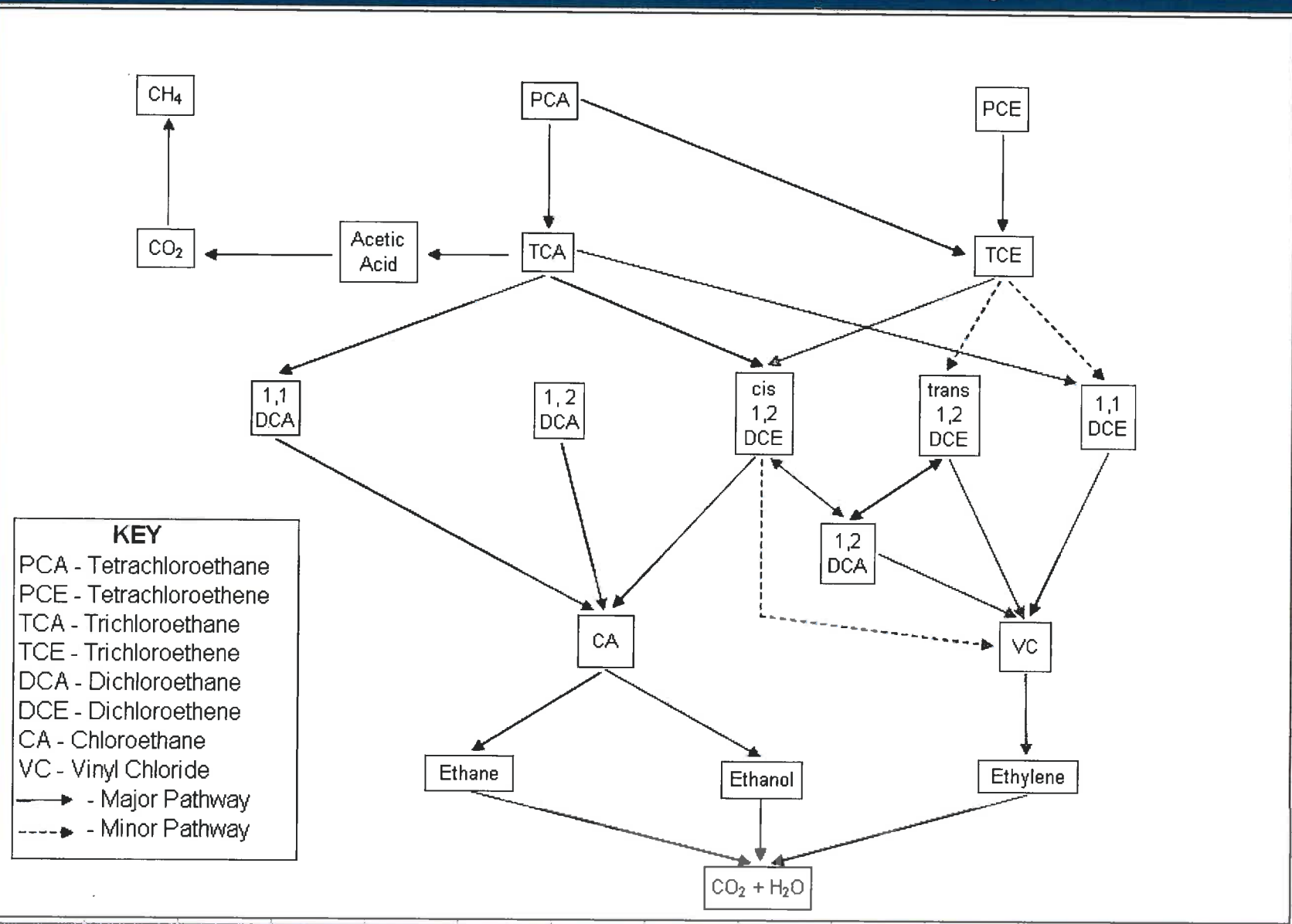
PCE IN GROUNDWATER
UPPER WATER BEARING INTERVAL

FIGURE
4
PROJECT NO.
2090-1970-1

Gritit AutoAssessment020312 JMP REV November 1, 2012 Gritit Site Vicinity Map



Figure 5

Transformations of chlorinated aliphatic hydrocarbons



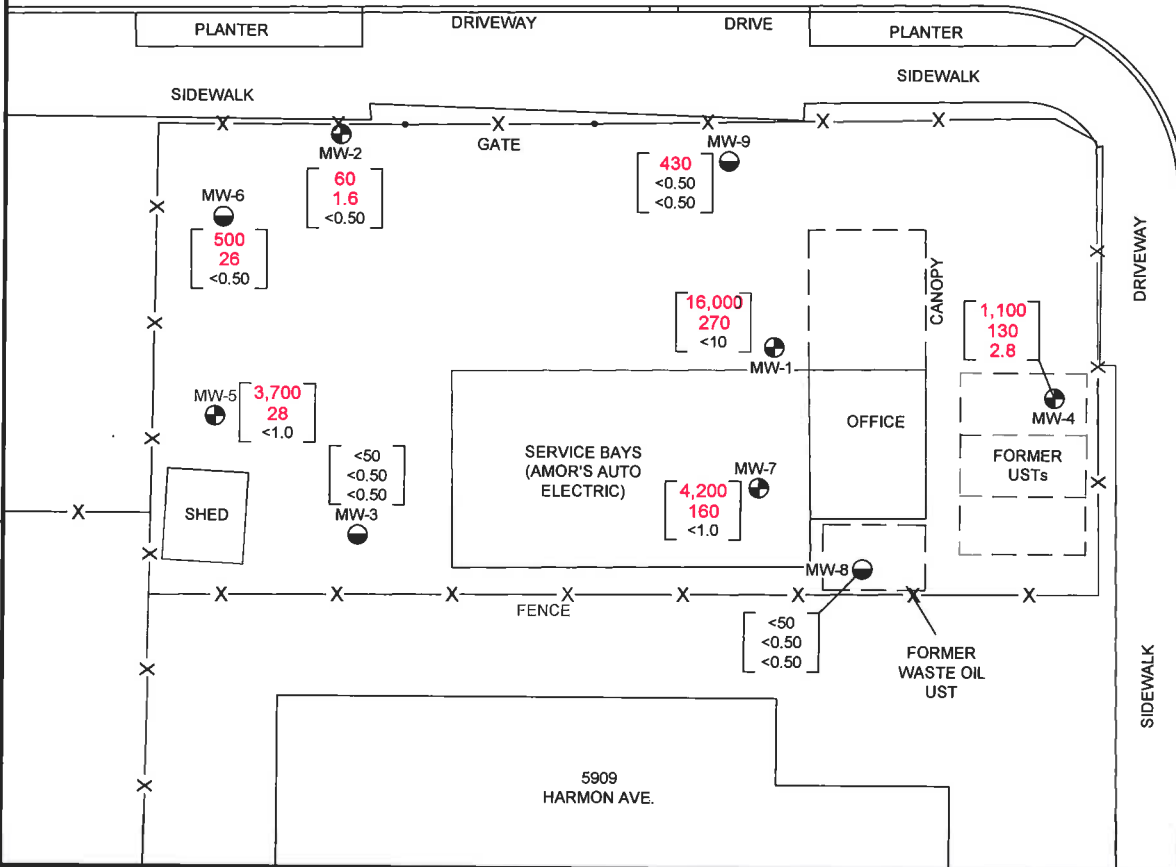


LEGEND

-  MW-1 DEEP SCREENED GROUNDWATER MONITORING WELL LOCATION
-  MW-3 SHALLOW SCREENED GROUNDWATER MONITORING WELL LOCATION
- [<50] GASOLINE RANGE ORGANICS (GRO) IN µg/L
- [<0.50] BENZENE CONCENTRATION IN µg/L
- [<0.50] METHYL TERTIARY BUTYL ETHER (MTBE) IN µg/L

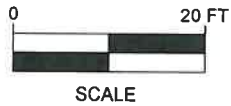
SAMPLES COLLECTED ON 7/16/12
 GRO ANALYZED BY EPA METHOD 8015B
 BENZENE & MTBE ANALYZED BY EPA METHOD 8260B

SEMINARY AVENUE



REV November 1, 2012 Gritmi NQuarterly
JMP Gritmi NQuarterly

STRATUS
ENVIRONMENTAL, INC.



FORMER GRITMI AUTO
 1970 SEMINARY AVENUE
 OAKLAND, CALIFORNIA
 PETROLEUM HYDROCARBON
 GROUNDWATER ANALYTICAL SUMMARY
 3rd QUARTER 2012

FIGURE
6
 PROJECT NO.
 2090-1970-1



LEGEND

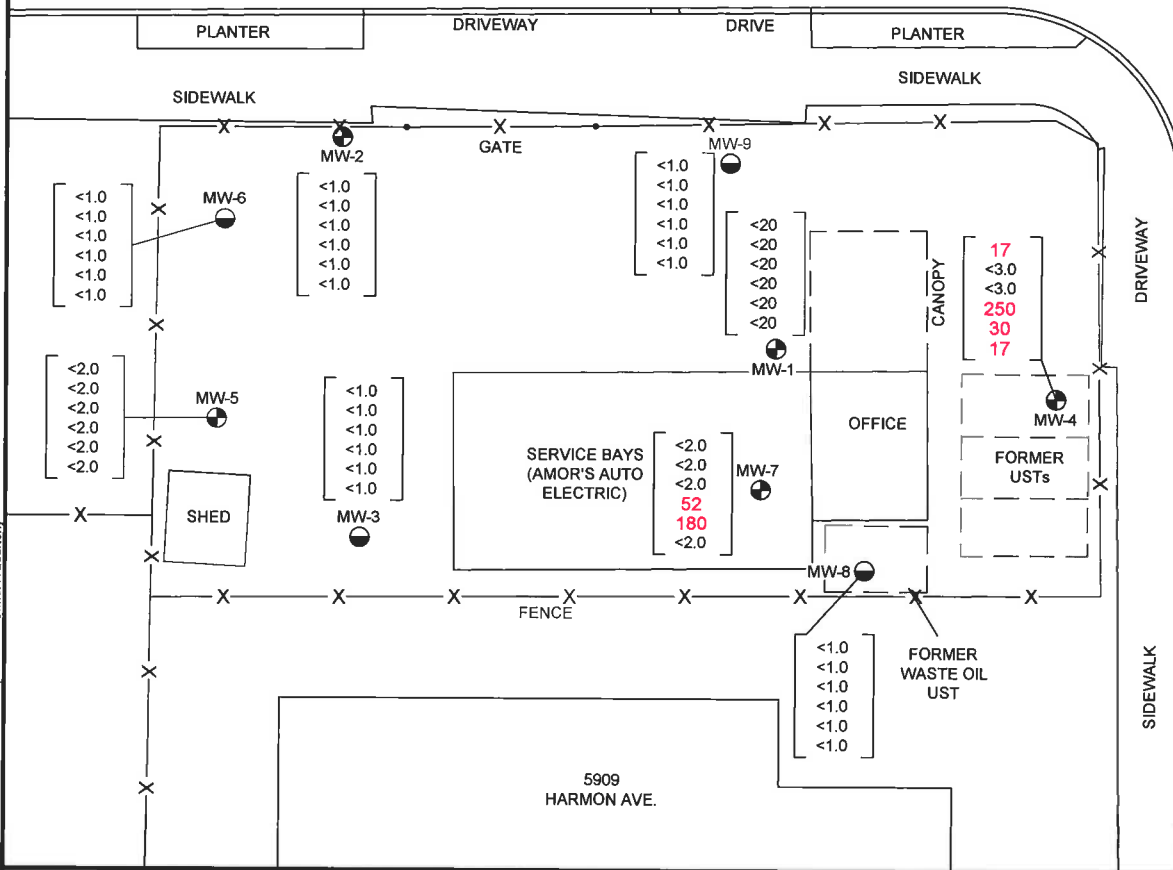
- MW-1 DEEP SCREENED GROUNDWATER MONITORING WELL LOCATION
- MW-3 SHALLOW SCREENED GROUNDWATER MONITORING WELL LOCATION

<1.0	1,2 DICHLOROBENZENE (1,2 DCB) IN µg/L
<1.0	TETRACHLOROETHENE (PCE) IN µg/L
<1.0	TRICHLOROETHENE (TCE) IN µg/L
<1.0	VINYL CHLORIDE (VC) IN µg/L
<1.0	cis-1,2 DICHLOROETHENE (cis-1,2 DCE) IN µg/L
<1.0	trans-1,2 DICHLOROETHENE (trans-1,2 DCE) IN µg/L

SAMPLES COLLECTED ON 7/16/12

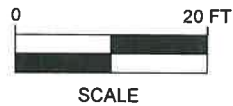
1,2 DCB, PCE, TCE, VC, cis-1,2 DCE,
& trans-1,2 DCE ANALYZED BY EPA METHOD 8260B

SEMINARY AVENUE



Grimt\Quarterly REV November 1, 2012 JMP

STRATUS
ENVIRONMENTAL, INC.



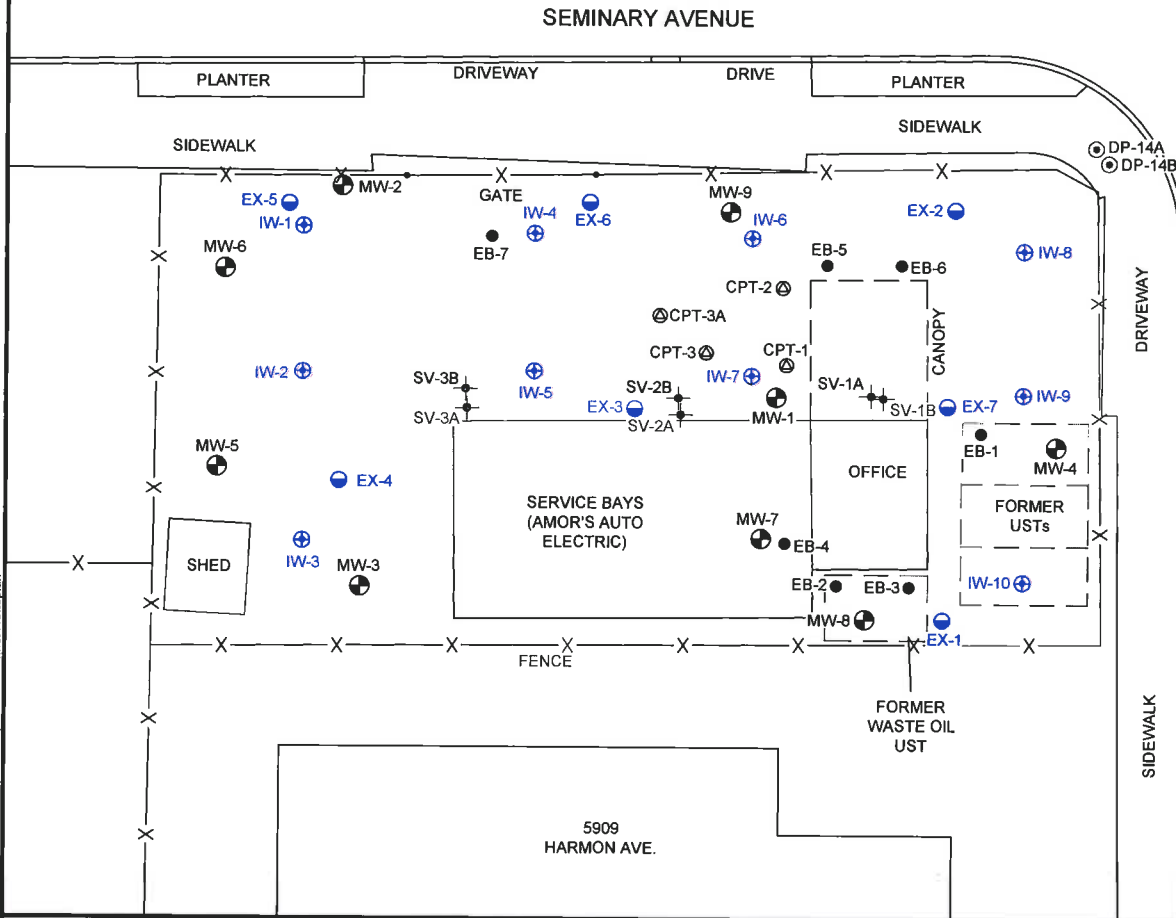
FORMER GRIMIT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA
HALOGENATED VOC GROUNDWATER
ANALYTICAL SUMMARY
3rd QUARTER 2012

FIGURE
7
PROJECT NO.
2090-1970-1



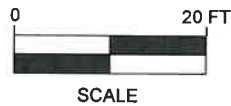
LEGEND

- ⊕ MW-1 GROUNDWATER MONITORING WELL LOCATION
- EB-1 APPROXIMATE EXPLORATORY BORING LOCATION
- ⊕ CPT-1 CPT/LIF BORING LOCATION
- ✦ SV-1A SOIL VAPOR SAMPLING WELL LOCATION
- ⊙ DP-14A DIRECT PUSH BORING LOCATION
- ⊕ EX-1 PROPOSED EXTRACTION WELL LOCATION
- ⊕ IW-1 PROPOSED OZONE INJECTION WELL LOCATION



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STRATUS
ENVIRONMENTAL, INC.



FORMER GRIMIT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

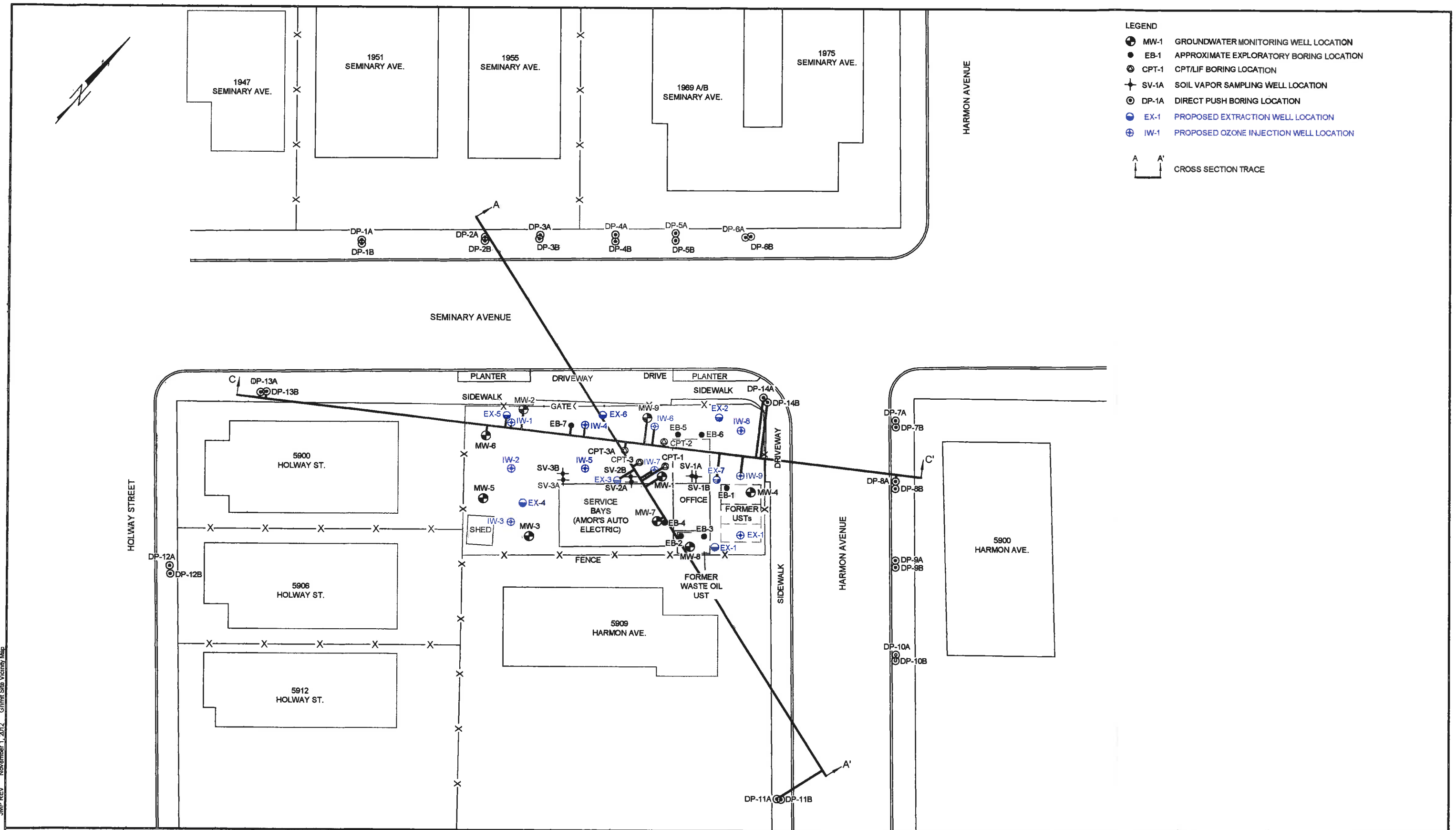
SITE PLAN DEPICTING PROPOSED EXTRACTION
AND OZONE INJECTION WELL LOCATIONS

FIGURE

8

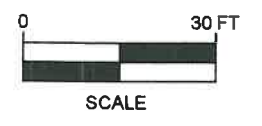
PROJECT NO.
2090-1970-1

JMP REV November 1, 2012 Gritmit Site Vicinity Map



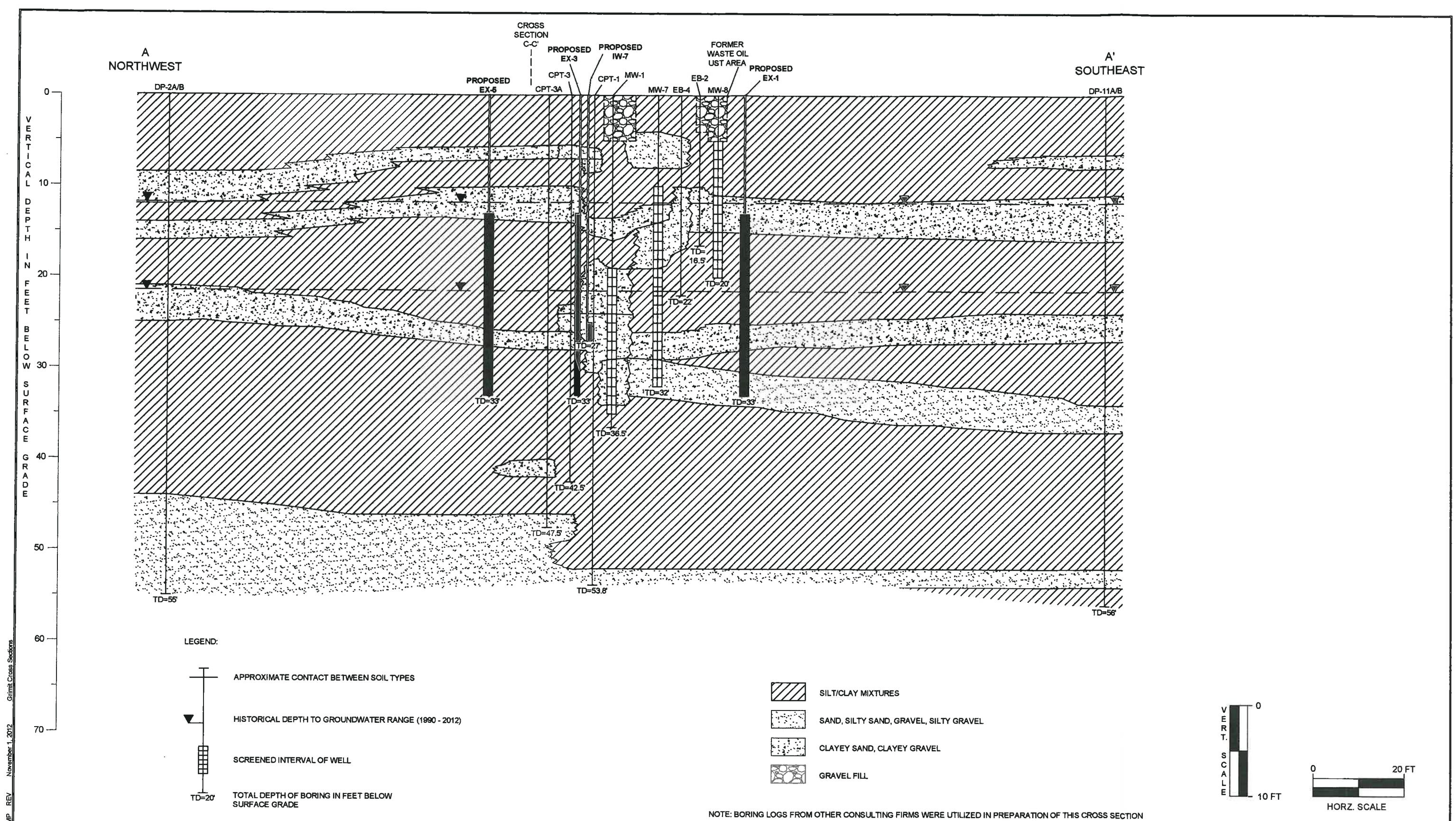
- LEGEND**
- ⊕ MW-1 GROUNDWATER MONITORING WELL LOCATION
 - EB-1 APPROXIMATE EXPLORATORY BORING LOCATION
 - ⊙ CPT-1 CPT/LIF BORING LOCATION
 - ⊕ SV-1A SOIL VAPOR SAMPLING WELL LOCATION
 - ⊙ DP-1A DIRECT PUSH BORING LOCATION
 - ⊕ EX-1 PROPOSED EXTRACTION WELL LOCATION
 - ⊕ IW-1 PROPOSED OZONE INJECTION WELL LOCATION
- A A' CROSS SECTION TRACE

STRATUS
ENVIRONMENTAL, INC.



FORMER GRIMIT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA
SITE VICINITY MAP

FIGURE
9
PROJECT NO.
2090-1970-1

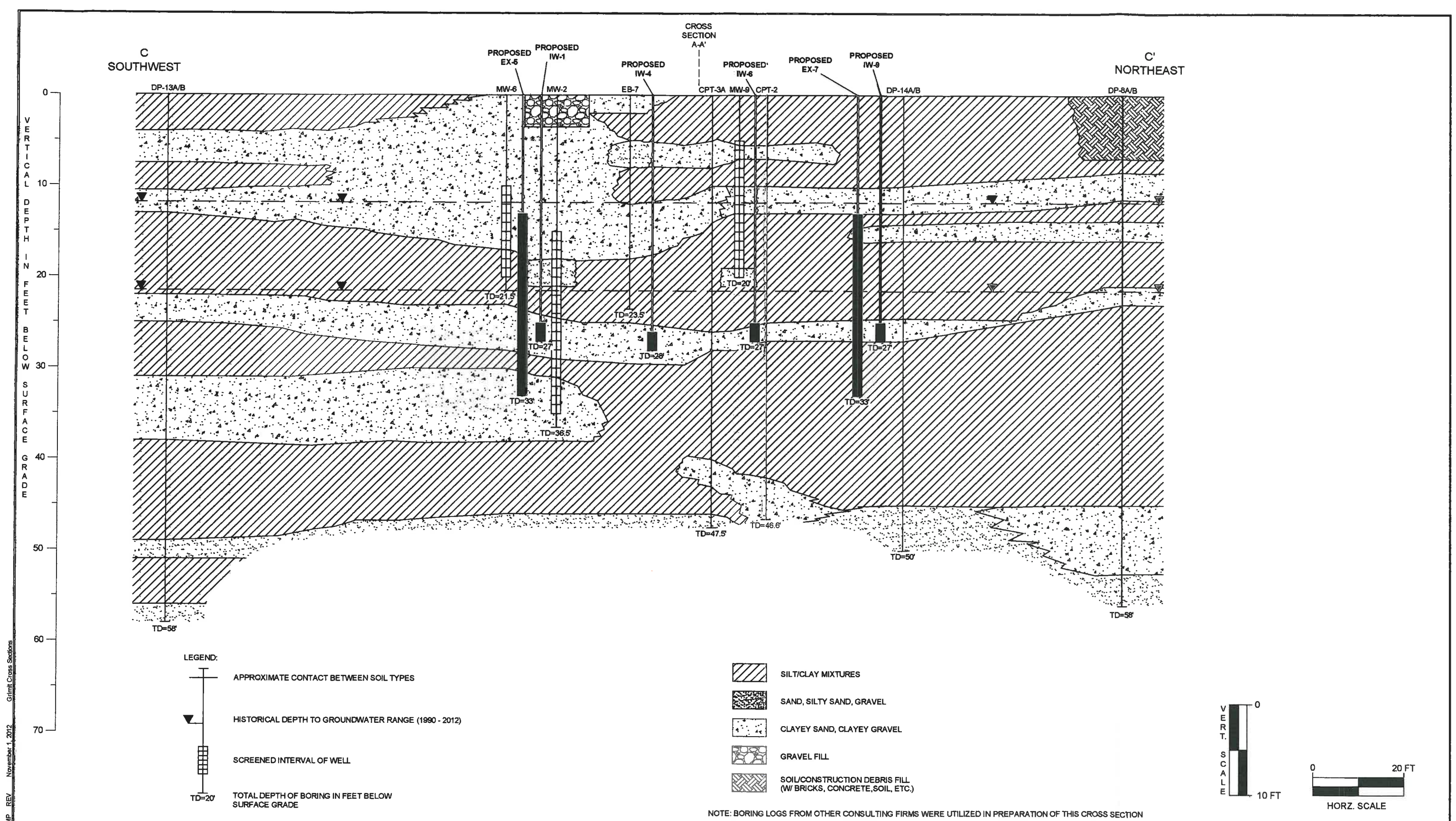


JMP REV November 1, 2012 Grimit Cross Sections
 GrimitCAP

STRATUS
ENVIRONMENTAL, INC.

FORMER GRIMIT AUTO
 1970 SEMINARY AVENUE
 OAKLAND, CALIFORNIA
 GEOLOGIC CROSS SECTION A-A'

FIGURE
10
 PROJECT NO.
 2090-1970-1



JMP REV November 1, 2012 Grimit Cross Sections



FORMER GRIMIT AUTO
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

GEOLOGIC CROSS SECTION C-C'

FIGURE
11
PROJECT NO.
2090-1970-1