THE SALVATION ARMY
ARC Command
180 East Ocean Boulevard 3Rd Floor
Long Beach, CA 90802-4709

FOUNDED IN 1865

February 1, 2017

Re: **Sensitive Receptor Survey Update Report - December 2016**
The Salvation Army Oakland ARC Building
601 Webster Street
Oakland, California
Fuel Leak Case No. R00003 084,
Geotracker Global ID T10000003428

"I have read and acknowledge the content, recommendations, and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website."

Submitted by:

Mark Nelson, Major
ARC Command General Secretary

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Molly Fagan, Property Project Manager
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ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

Modesto Branch
1117 Lone Palm Avenue
Suite 201B
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January 25, 2017

Mr. Keith Nowell, PG, CHG
Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Health Services, Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: **Sensitive Receptor Survey Update Report**
December 2016
The Salvation Army Oakland ARC
601 Webster Street,
Oakland, California,
Fuel Leak Case No. R00003084,
Geotracker Global ID T10000003428

Dear Mr. Nowell,

ATC Group Services LLC (ATC) has prepared this *Sensitive Receptor Survey Update Report, December 2016*, on behalf of The Salvation Army for their Oakland Adult Rehabilitation Center (ARC) facility located at 601 Webster Street in Oakland, California.

If you have questions or comments regarding this report or our recommendations, please contact us at your convenience.

Sincerely,

ATC Group Services LLC

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Project Manager
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Geotracker website	http://geotracker.waterboards.ca.gov

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Sensitive Receptor Survey Update Report
January 2017

The Salvation Army Oakland ARC Building
601 Webster Street,
Oakland, California,
ACEH Fuel Leak Case No. R00003084,
Geotracker Global ID T10000003428

Submitted to:

Mr. Keith Nowell, PG, CHG
Hazardous Materials Specialist
Alameda County
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

On behalf of:

Salvation Army ARC Command
180 E. Ocean Blvd, 3rd Floor
Long Beach CA 90802

Submitted by:

ATC Group Services, LLC
1117 Lone Palm Avenue
Suite 201B
Modesto, California 95351
ATC Project No. Z054000006-0008

January 25, 2017

Sensitive Receptor Survey Update Report
January 2017

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1. Site Description

The site is The Salvation Army's (TSA) Adult Rehabilitation Center (ARC) (site) located at 601 Webster Street in Oakland, California, as shown on **Figure 1**. The site occupies the entire city block between Webster and Franklin Streets; and between Sixth and Seventh Streets. The northeast portion of the site includes the truck enclosure area. This area is where the former underground storage tank (UST) system was located. Fencing or walls enclose the truck enclosure area, which is used for loading/unloading trucks and for overnight truck parking/security. **Figure 2**, Site Plan illustrates the pertinent site features and the surrounding area.

1.2. Geology and Hydrogeology

1.2.1. Regional Geology and Hydrogeology

The City of Oakland is located within the San Francisco Bay Area Physiographic Province and is bounded by the San Francisco Bay to the northwest, west, and southwest and by the Oakland Hills to the east. The landmass on which Oakland is located was formed as a result of an uplift of the Oakland Hills along the Hayward Fault out of the San Francisco Bay basin, which lies to the north and west. The area where Oakland is located is covered with alluvium from the Sierra Nevada mountain range deposited by the San Joaquin and Sacramento River systems, and by local creeks and streams flowing from the Oakland Hills. Sedimentary deposits consisting of non-marine sandstone, conglomerate, and mudstone underlie the alluvium.

The site lies within the East Bay Plain Sub-basin 2-9.04. In general, groundwater in this basin is designated as beneficial for municipal and domestic water supply, industrial process and service water supply, and agricultural water supply. Despite this designation, according to EBMUD, all potable drinking water for the City of Oakland is imported from the Mokelumne River watershed.

Regional topography generally rises from sea level at the Oakland Inner Harbor, southeast of the site, to the north-northeast parallel to named streets (e.g. Broadway, Franklin, Webster, etc.) and perpendicular to the numbered streets (6th, 7th, 8th, etc.).

The nearest surface water body to the site is Oakland Inner Harbor/Oakland Estuary, located approximately 2,000 feet to the south. Lake Merritt lies approximately 3,250 feet to the east-northeast upgradient of the site.

1.2.2. Site-Specific Geology and Hydrogeology

Soil from borings SB1, SB2, and SB7 advanced at the site in July 2103 consisted of fill material placed in the former tank pit to a depth of approximately 13 to 15 feet bgs. Silty sand and fine sand were encountered from 15 feet to 25 feet in SB1, and from 13 feet to 20 feet in SB2 and SB7, the maximum depths to which these borings were characterized.

Soil from the borings SB3, SB4, and SB5 consisted of sandy clay or clayey sand to a depth of approximately 5 to 7 feet bgs. Silty sand and fine sand were encountered from depths between

5 to 7 feet and 20 feet, the maximum depths to which the borings were characterized, with the exception of SB3 that had sandy clay from 16 to 18 feet bgs.

Soil from the boring SB6 consisted of silty sand to a depth of approximately 5 feet bgs. Fine sand was encountered from 5 feet to 15 feet bgs, and silty sand was encountered between 15 feet and 20 feet, the maximum depth to which the boring was characterized.

The surface topography in the site vicinity slopes significantly from the northeast to the southwest. Therefore, based on local topography, the inferred groundwater flow direction is to the southwest. Site-specific data flow varies from southeast to southwest.

ATC reviewed Geotracker-obtained data from nearby leaking underground storage tank (LUST) sites to provide some contest in understanding groundwater flow direction in the general area of the site. The LUST sites reviewed are identified in the table below along with the observed groundwater flow direction recorded at each site.

Nearby LUST Sites

GeoTrackerID	Snum	Street Name	Site Name	aka	GW Flow Direction	Status
T10000003428	601	Webster	The Salvation Army	Subject Site	W/SW	Open
SL0600167382	423	7th	Howard Johnson Express Inn	8 Orchids Condos	W/SW	Closed
T0600101263	461	8th	Shell		SW	Open
T0600101486	800	Harrison	Unocal #0752		S/SW	Open
T0600102122	726	Harrison	Chan's Shell Service Station		S/SW	Open
T0600100985	706	Harrison	Oakland Auto Parts		S/SW	Open
T0600101036	388	9th	Pacific Renaissance Plaza		W	Closed
T0600100050	800	Franklin	Bill Louie's Auto Service	Chiu Property	W/NW	Open

These sites and their associated groundwater flow direction are depicted in **Figure 3**. The blue arrow associated with each site depicts the observed groundwater flow direction.

ATC has observed that the LUST site's proximity to the Bay Area Rapid Transit's (BART) subsurface structure appears to correlate to a deviation from the inferred regional groundwater and may be the result of the BART tunnel dewatering system.

2.0 DESKTOP WELL REVIEW

2.1. Previous 2015 Review

On September 11, 2015, ATC contacted the both the California Department of Water Resources (DWR) and the Alameda County Public Works Agency, Water Resources (ACPWAWR) to assist in identifying active groundwater production wells that may be present within a 2,000 foot radius of the release point. ATC received the requested

information from DWR on January 12, 2016 and the results of the sensitive receptor survey are included in this report.

Pursuant to Chapter 10, Article 3, Section 13752 of the California Water Code, well completion logs provided by the DWR are to be held confidential. Because of the confidential nature of well construction and location information, the actual well construction records are not included with this report, but upon request will be provided separately to the ACEH or RWQCB.

The search area is depicted on a National Wetlands Inventory map produced by the Federal Emergency Management Agency (FEMA) that is included as **Figure 4**.

DWR and the ACPWAWR identified a combined 742 wells within the requested search area. ATC reviewed the information provided and eliminated 107 of the wells as being located outside the 2,000-foot radius search area.

ATC initially identified and eliminated an additional 631 wells because they were duplicated on both the DWR and the ACPWAWR lists or their function was for non-consumptive, non-reuse, or non-water extraction purposes as defined below:

- Wells for non- consumptive uses:
  - Geotechnical investigation,
  - Geophysical investigation,
  - Environmental Investigation/remediation
    - Monitoring wells,
    - Recovery Wells – Vapor, water,
    - Soil Vapor Sampling Points,
    - Piezometers,
  - Construction dewatering wells,
  - Other Test wells,
  - Cathodic protection wells,
  - Well destroyed (through permit),
  - Wells abandoned and not being used but not listed as destroyed,
  - Unknown, no information found or given.

After screening wells for the above uses, four (4) wells potential sensitive receptor wells remained within SRS search area because of one or more of the following reasons:

- Unknown use
- Water extraction wells for beneficial uses:
  - Municipal well,
  - Industrial well,
  - Irrigation well,
  - Domestic well.

These four wells are identified in **Table 1** as wells “A”, “B”, “C”, and “D”. The approximate the locations of these wells and observed surface water features are also depicted on **Figure 4.**

2.2. 2016 Update

During a meeting held on May 4, 2016 ATC presented the results of the SRS well survey to Mr. Nowell of ACEH. Mr. Nowell indicated that cathodic protection wells should be included on the list of potential sensitive receptor wells.

ATC again reviewed the original 742 candidate wells adding cathodic protection wells as potential receptors. ATC found two cathodic protection wells located in the defined area of the search. These are identified as wells "E" and "F" in **Table 1.** The remainder of the information available from DWR and CPWAWR are included in the left portion of **Table 1**.

ATC used the information regarding distance and direction to identify the addresses corresponding to the distance and direction relative to the TSA Site. This information is located in the middle columns of **Table 1**. This information was then transferred to **Figure 5.**

ATC then used the inferred groundwater flow direction (**Figure 5 – purple arrow**) to determine the each well's position to the site relative to the direction of groundwater flow. This information is in the right column of **Table 1**. Using all the available published information, ATC determined that all the identified potential receptor wells are upgradient, or cross gradient of the TSA site and therefore unlikely be impacted by the release from the TSA Site.

3.0 SRS FIELD RECONNAISSANCE

As a follow-up to the desktop well review, ATC attempted to verify the presence of the six potential SRS wells.

3.1.1. Field Reconnaissance of Potential Sensitive Receptors

On November 17, 2016, ATC performed limited field reconnaissance of the six potential SRS wells, to verify their existence and to determine if any special circumstances should preclude their inclusion or elimination as a potential sensitive receptor.

3.1.1.1. Pacific Renaissance Plaza Building - 388 9th Street

The first site was identified as 388 9th Street also known as Pacific Renaissance Plaza is approximately 800 feet and north northwest of the TSA site. ATC spoke with Mr. George Cheung, the Maintenance Supervisor who stated the Plaza has a large, three-level, subsurface parking structure dewatered by three large industrial sump pumps. Mr. Cheung could not recall size of the pumps or the ultimate receiver of the pumped water (e.g. sewer, storm sewer etc.). Due to the site's close proximity to the TSA Site, ATC collected Mr. Cheung's contact information and will expand this investigation if warranted.

3.1.1.2. Frank G. Mar Community Housing Building - 283 13th Street

ATC attempted to contact personnel at the Frank G. Mar Community Center located at 283 13th Street is approximately 1,850 feet northeast of the TSA Site. Engineered security at the building prevented access except for the entrance of the parking structure. ATC checked with the parking attendant and he confirmed the building had several subsurface parking levels. The building manager provided contact formation for the Building Maintenance Supervisor Mr. Han. ATC

retained this information but due to the site's relative distance and upslope elevation relative to the TSA site, in ATC's judgement this site will not warrant further investigation.

3.1.1.3. Oakland City Center – 1111 Broadway

This building is 1,500 feet northwest of the TSA Site. This address is comprised of a complex of multi-story, high-rise buildings including 1001 Broadway (Oakland Marriot), 1111 Broadway (Oakland City Center), 1221 Broadway (The Clorox Building), and 1333 Broadway. Most of these buildings include underground parking structures. This complex is reported to have an irrigation well. The ability of an irrigation well to influence local hydrology drew ATC to investigate further but the site's relative distance and upslope elevation relative to the TSA Site, will likely not warrant further investigation.

3.1.1.4. PG&E Cathodic Protection Wells

ATC could not find either of the identified PG&E cathodic protection well at the time of this report. ATC will work with PG&E to identify the locations of these wells and report on them in a future report. In the context of the observed groundwater gradient at the site, the potential receptor wells "E" and "F" are cross gradient from the site. Additionally since cathodic protection wells do not extract groundwater, cathodic protection wells would only become pertinent if located within an area where contaminated groundwater was present, and a negative vertical gradient were present allow the cathodic protection well to function as a conduit to draw contamination deeper. Presently there is no indication either of these conditions exist. If updated knowledge regarding either of these conditions change, then additional investigation may be warranted.

4.0 ADDITIONAL POTENTIAL RECEPTORS

In addition to the well search, ATC considered that other nearby properties with subsurface structures may have dewatering systems and, therefore, could be potential receptors.

4.1.1. BART's Subsurface Infrastructure

4.1.1.1. BART's 12th Street Station.

During the field reconnaissance, ATC observed the Bay Area Rapid Transit (BART) 12th Street Station when investigating the Oakland City Center Building. It was immediately apparent while his station was visible from the surface, the physical location of the station and the associated BART track extended a minimum of 30 to 40 feet below the ground surface. Dewatering or groundwater exclusion could be necessary to maintain a dry space below the groundwater surface. This particular station is likely to distance from the TSA PHC release point to warrant additional investigation at this time.

4.1.1.2. BART's Subsurface Tunnels

ATC found several map references indicating BART utilizing subsurface tunnels in this part of Oakland near the site. The outline for these area tunnels or tubes is illustrated by the blue dotted line on **Figure 5**. This map indicates one BART subsurface tunnel crosses between the Pacific Renaissance Plaza Building and the TSA Site. A second subsurface BART tunnel appears to veer

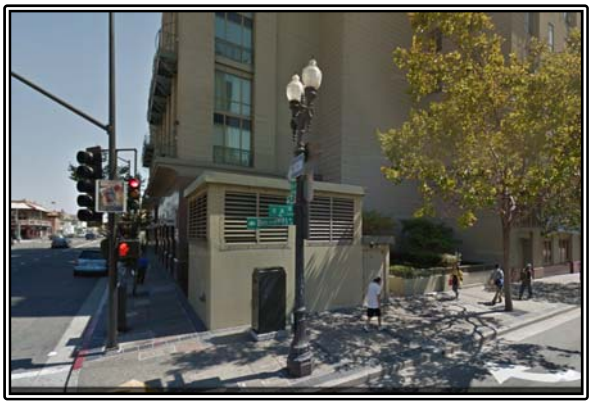
off near the intersection of 9th and Webster Streets and passes underneath or near the edge of the 7th and Broadway intersection.

4.1.1.3. Triangular BART Building

During the field reconnaissance, ATC observed a triangular shaped property on the southeast corner of Broadway and 7th Streets with markings indicating it was part of the BART system. (Photos below).

BART Utility Building, 7th and Broadway

Source: ATC Camera



Source: Google Street View

Subsequent research of the LUST records available on Geotracker indicates this building has both a ventilation shaft and BART dewatering sump. Reports from the 461 8th Shell LUST site indicate that gasoline emanating from the release at that location were collected in and later removed from the BART sump accessed through this location.

4.1.2. 8 Orchids Condos Building - 423 Seventh Street

During the field reconnaissance, ATC sought to identify the building adjacent to the west of TSA Used Car Lot. Information first gained during the field reconnaissance and reinforced with subsequent Geotracker information identified the building as the 8 Orchids Condos building at 423 Seventh Street. A LUST report indicated the 8 Orchids Condos building as having a multilevel subsurface parking structure.

5.0 SUMMARY / DISCUSSION

- ATC observes that during the four-groundwater monitoring events the observed gradient is variable ranging from southeast to southwest.
- The groundwater flow direction on site is generally to the southeast. While a significate groundwater elevation decrease is noted in the one offsite monitoring well (MW-4) implying a groundwater flow to the southwest in that locations.
- DWR and ACPWAWR database searches identified four production wells and two cathodic protection wells within the 2,000-foot radius search area from site.
- Additional investigation determined that all six wells are located upgradient or cross gradient of the TSA Site.
- Some multi-story buildings in the site vicinity (e.g. the Site and 8 Orchids Condos Building) may have sumps to dewater their subsurface structures, but these sumps were not included in the list of permitted wells obtained from traditional sources.
- The proximity of BART's subsurface infrastructure may include dewatering components that could potentially be a receptor and could be influencing the hydrology local to the TSA Site.

6.0 LIMITATIONS

This report was prepared in accordance with the scope of work outlined in ATC's contract and with generally accepted professional engineering and environmental consulting practices existing at the time. This report was prepared and applicable to the location of the site. ATC makes no other warranties, expressed or implied.

TABLES

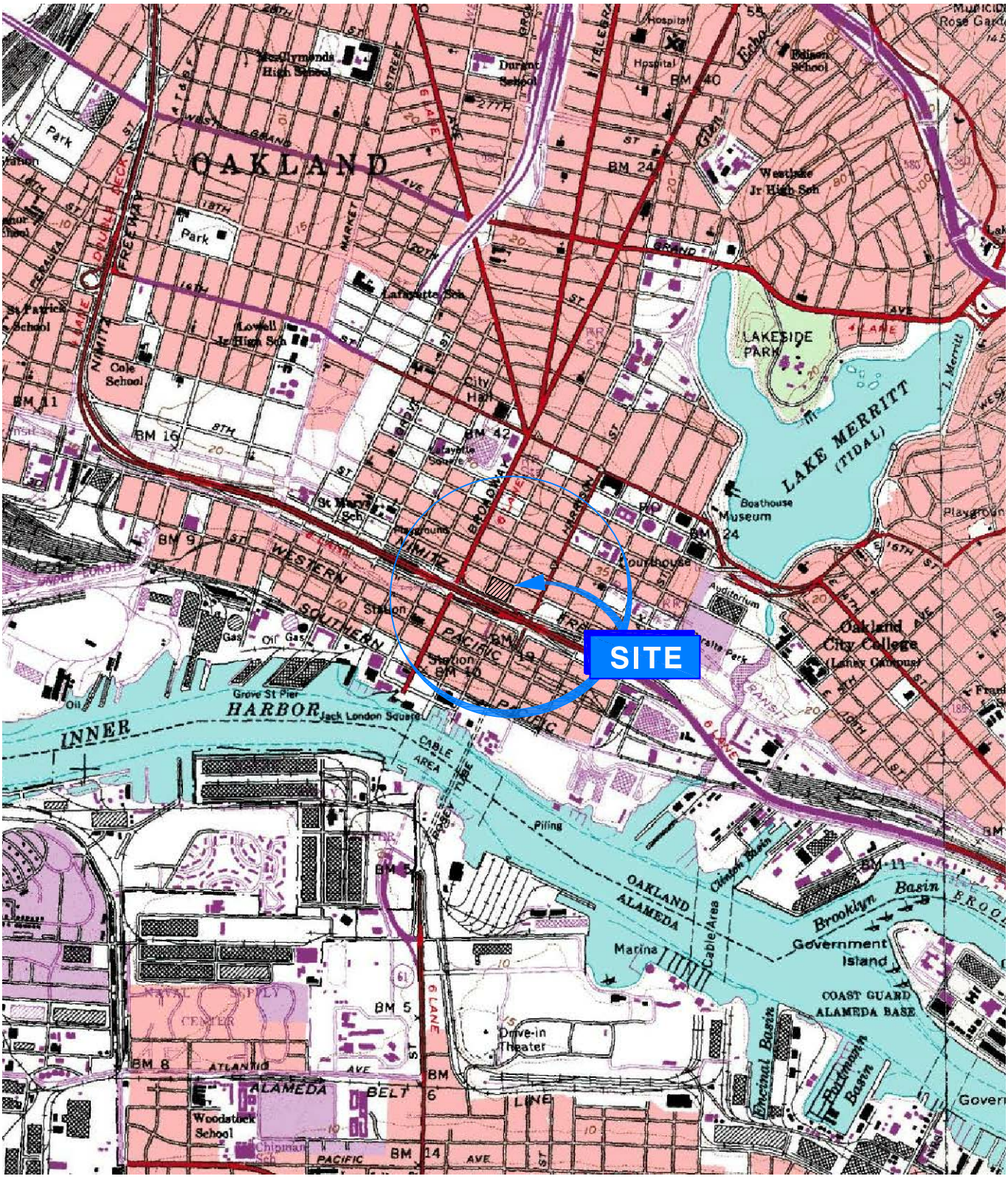
ENVIRONMENTAL • GEOTECHNICAL

Table 1
Potential Sensitive Receptor Wells
The Salvation Army
Adult Rehabilitation Center (ARC)
601 Webster Street, Oakland, California

Info available from DWR and CPWAWR									Determined by ATC		
Well ID	**Source**	**Distance**	**Direction**	**Listed or Presumed Use**	**Drill Date/Year Installed**	**Total Depth**	**Screen Interval**	**Casing Diameter**	**Address**	**Property Name**	**Gradient**
		Location relative to TSA Site				*(feet bgs)*	*(feet bgs)*	*(inches)*			
A	ACDPW	800	n/nw	unk	unk	unk	unk	unk	388 9th Street	Pacific Renaissance Plaza Building	up
B	ACDPW	1,850	ne	unk	unk	unk	unk	unk	283 13th Street	Frank G. Mar Community Housing Building	up
C	ACDPW	1,850	ne	unk	unk	unk	unk	unk			
D	DWR	1,500	nw	irrigation	7/9/90	470	180 - 470	16/6	1111 Broadway	Oakland City Center Building	up
E	ACDPW	715	se	cathodic	6/1/73	120	unk	unk	6th & Webster	PGE	cross
F	ACDPW	1,988	s/se	cathodic	2/1/75	120	unk	unk	Alice & Embarcadero	PGE	cross

FIGURES

ENVIRONMENTAL • GEOTECHNICAL



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP
OAKLAND WEST QUADRANGLE, CALIFORNIA, DATE 1959, PHOTO-UPDATED 1980

FIGURE 1
SITE LOCATION MAP
THE SALVATION ARMY
601 WEBSTER STREET
OAKLAND, CALIFORNIA

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1117 LONE PALM AVE., SUITE 201
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PROJECT NUMBER: Z054000006		
DESIGNED BY: MDS	APPROVED BY: JH	DATE: 1-22-15
REVIEWED BY: MDS	DRAWN BY: DAW	SCALE: 1:24,000

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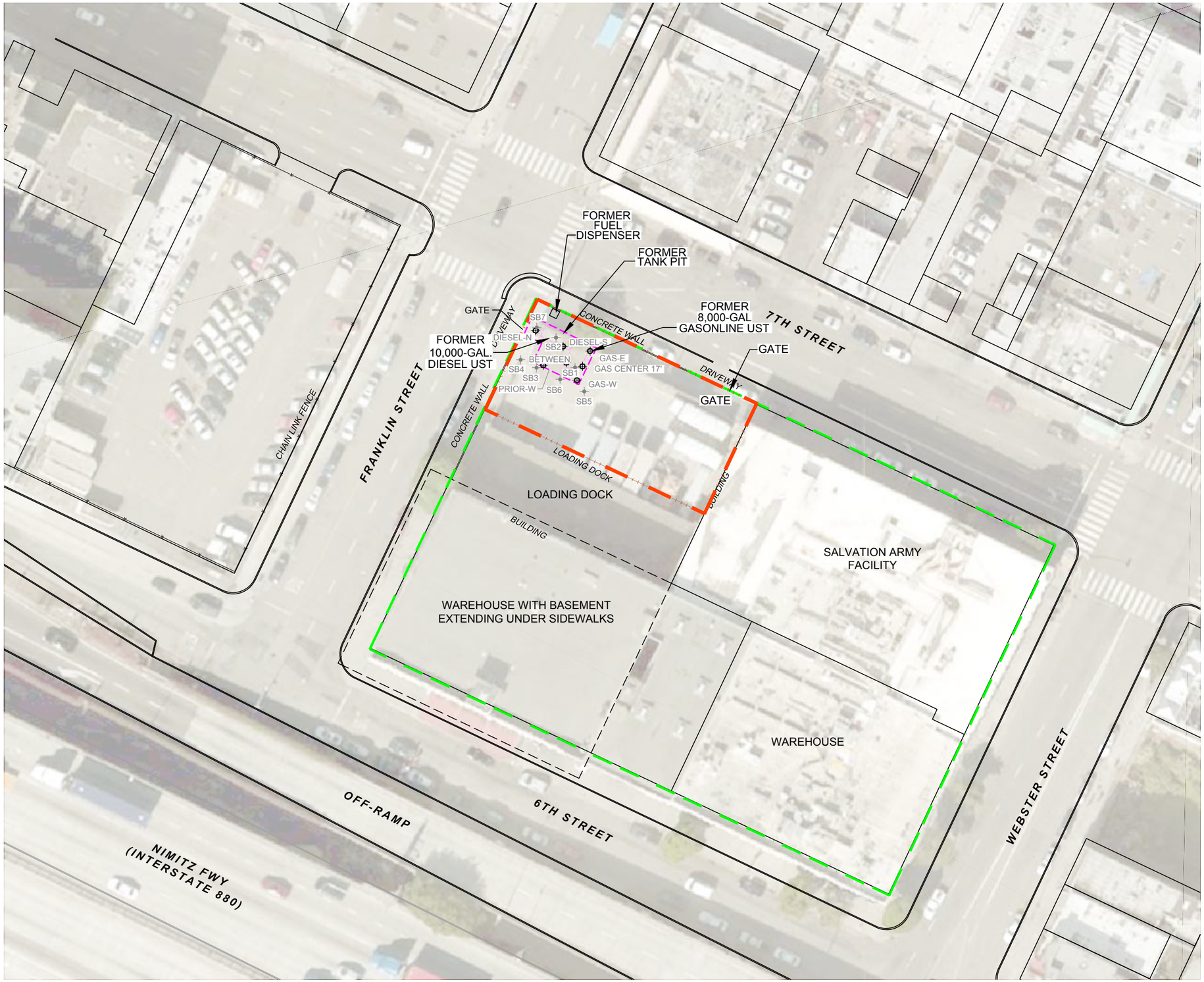

LEGEND

- APPROXIMATE FACILITY BOUNDARY
- FORMER UST
- FORMER EXCAVATION
- TRUCK ENCLOSURE AREA
- FORMER DIRECT PUSH BORING
- SOIL BORING

0 50' 100'

SCALE, FT

NOTE: SCALE AND LOCATIONS ARE APPROXIMATE

N

SITE PLAN

THE SALVATION ARMY
601 WEBSTER STREET
OAKLAND, CA

FIGURE 2

DATE: 12-8-15
DRAWN BY: DAW

PROJECT NUMBER: Z0540000066
APPROVED BY: M. SONKE

ATC ENVIRONMENTAL • GEOTECHNICAL BUILDING SCIENCES • MATERIALS TESTING
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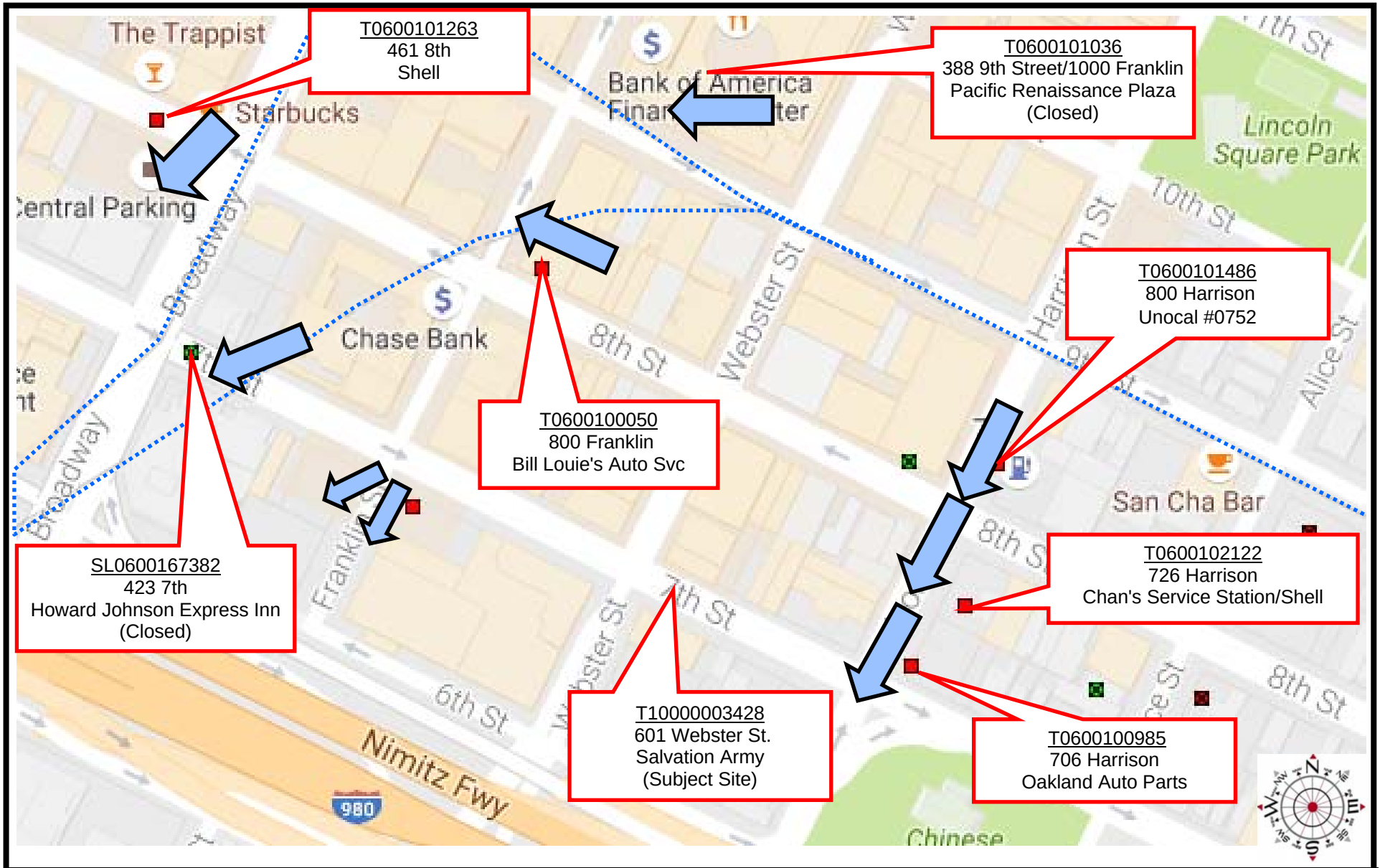
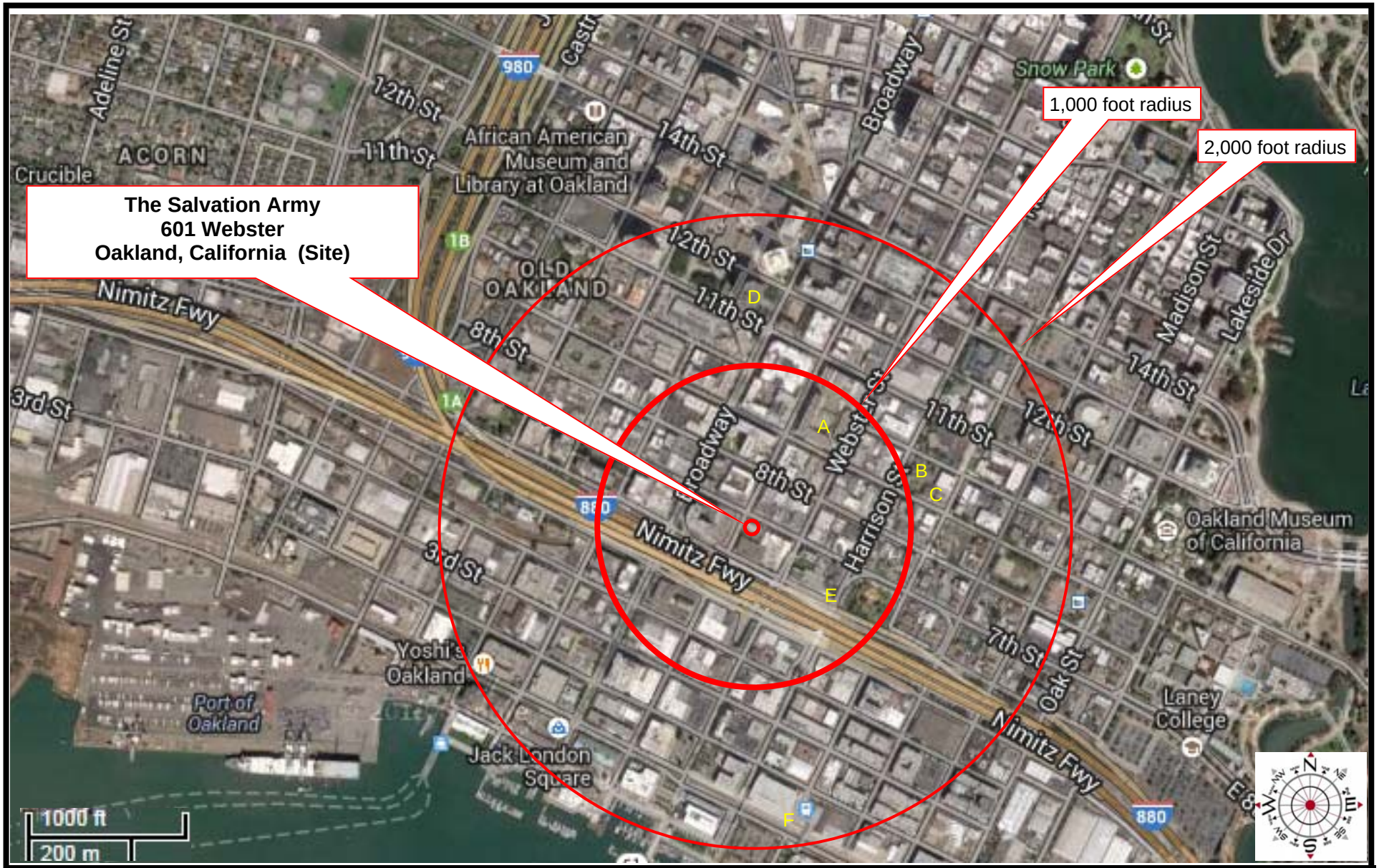
FILE: M:\Enviromental\25026 – The Salvation Army\TSA-O-UST 601 Webster Oakland\Drawing & Figures\DWGs\04 Denise's CAD Folder\2015 4Q GW Contour 2.dwg Apr 26, 2016 – 2:43pm Denise.Walp



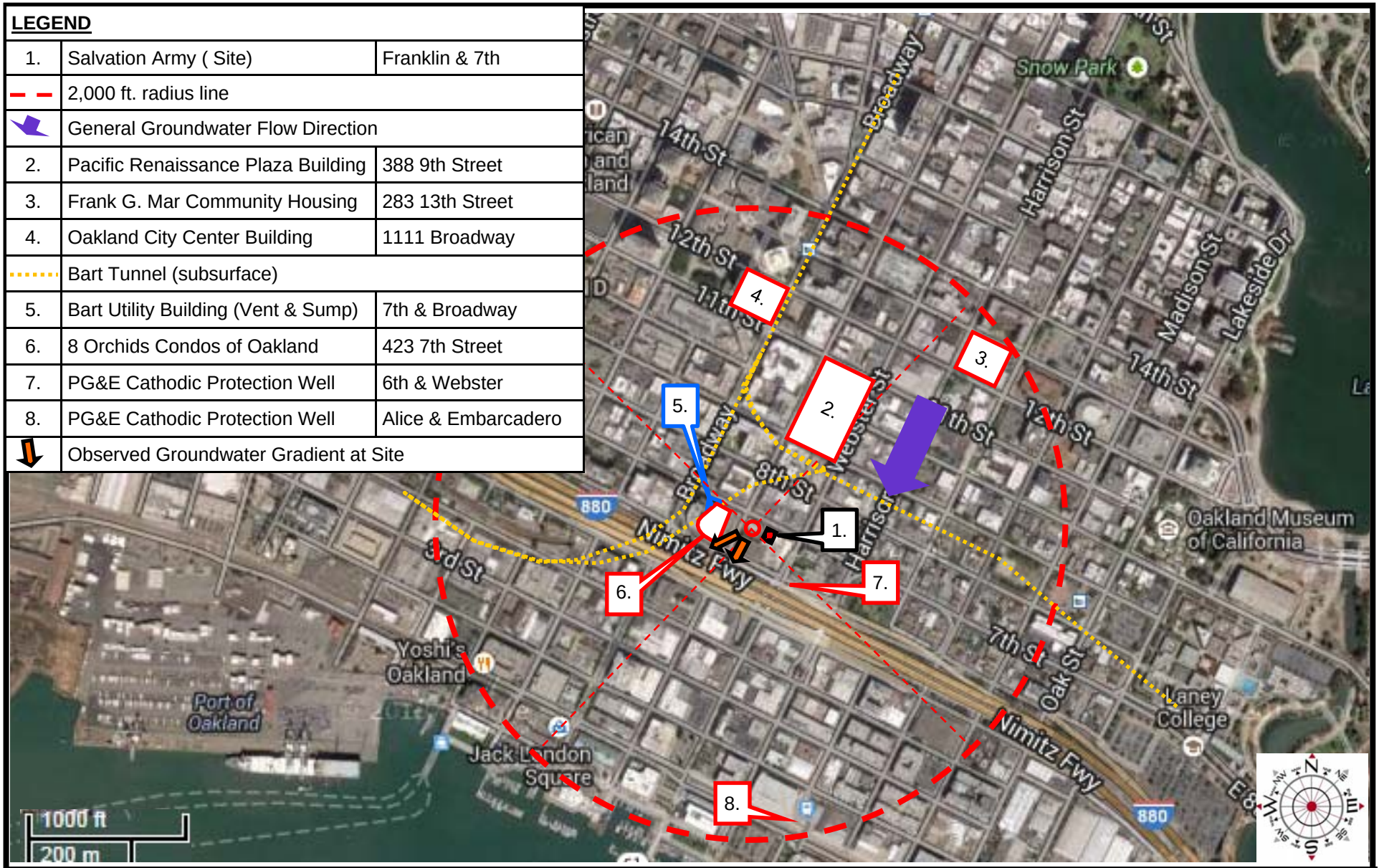
PROJECT NUMBER:	**Z054000006**	DATE:	**January 2017**	**Nearby LUST Sites** **(& respective groundwater flow direction)**	**Figure 3**
APPROVED BY:	**GS**	DRAWN BY:	**MDS**		
ATC		**1117 Lone Palm Ave. Suite 201 Modesto, CA 95351 (209) 579-2221**		**The Salvation Army Oakland ARC 601 Webster Street, Oakland, California,**	



PROJECT NUMBER:	Z054000006	DATE:	January 2017	Sensitive Receptor Survey Area of Search & Prospect Well Locations	Figure 4
APPROVED BY:	GS	DRAWN BY:	MDS		
ATC		1117 Lone Palm Ave. Suite 201 Modesto, CA 95351 (209) 579-2221		The Salvation Army Oakland ARC 601 Webster Street, Oakland, California,	

LEGEND

1.	Salvation Army (Site)	Franklin & 7th
	2,000 ft. radius line	
	General Groundwater Flow Direction	
2.	Pacific Renaissance Plaza Building	388 9th Street
3.	Frank G. Mar Community Housing	283 13th Street
4.	Oakland City Center Building	1111 Broadway
	Bart Tunnel (subsurface)	
5.	Bart Utility Building (Vent & Sump)	7th & Broadway
6.	8 Orchids Condos of Oakland	423 7th Street
7.	PG&E Cathodic Protection Well	6th & Webster
8.	PG&E Cathodic Protection Well	Alice & Embarcadero
	Observed Groundwater Gradient at Site	



PROJECT NUMBER:	Z054000006	DATE:	January 2017	Field Reconnaissance Map	Figure 5
APPROVED BY:	GS	DRAWN BY:	MDS		
ATC		1117 Lone Palm Ave. Suite 201 Modesto, CA 95351 (209) 579-2221		The Salvation Army Oakland ARC 601 Webster Street, Oakland, California,	