

Detterman, Mark, Env. Health

From: Sami Malaeb [s.malaeb@comcast.net]
Sent: Friday, June 01, 2012 9:55 AM
To: Detterman, Mark, Env. Health
Cc: rbatiste@eec-corp.com; colisa@me.com; britpete@aol.com
Subject: RE: 2145 35th Avenue, Oakland, CA - Petroleum Hydrocarbons in Water - Calculated Groundwater Flow Direction - Proposed Well Locations - Well Diagram -

Thanks Mark. I will keep you updated.

Sami Malaeb, P.E., R.E.A.
TEL: (925) 858-9608
Email: s.malaeb@comcast.net

From: Detterman, Mark, Env. Health [mailto:Mark.Detterman@acgov.org]
Sent: Friday, June 01, 2012 9:34 AM
To: 'Sami Malaeb'
Cc: rbatiste@eec-corp.com; colisa@me.com; britpete@aol.com
Subject: RE: 2145 35th Avenue, Oakland, CA - Petroleum Hydrocarbons in Water - Calculated Groundwater Flow Direction - Proposed Well Locations - Well Diagram -

Sami,

Thanks for the data clarification. The data do support removal of all fuel oxygenates, lead scavengers, and a full scan 8260. I would request that MTBE continue to be included in the analytical suite as it can be captured without additional cost and can provide some data on the vicinity groundwater quality. The changes in well diameter appear to be an appropriate modification based on potential future uses. In regards to the well length, I do believe that field calls are the appropriate place to make the final well length selection; however, in reviewing the soil bores, it does appear the screens can be shortened slightly without sacrificing future usefulness of the wells. In the end, I will leave that call to your professional judgment.

Let me know if you have questions; otherwise let me know a couple days before the work will begin.

Best,

Mark Detterman
Senior Hazardous Materials Specialist, PG, CEG
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502
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PDF copies of case files can be downloaded at:

<http://www.acgov.org/aceh/lop/ust.htm>

From: Sami Malaeb [<mailto:s.malaeb@comcast.net>]
Sent: Friday, June 01, 2012 8:52 AM
To: Detterman, Mark, Env. Health
Cc: rbatiste@eec-corp.com; colisa@me.com; britpete@aol.com
Subject: RE: 2145 35th Avenue, Oakland, CA - Petroleum Hydrocarbons in Water - Calculated Groundwater Flow Direction - Proposed Well Locations - Well Diagram -

Hi Mark:

Thank you for your speedy reply after our conversation yesterday. In your email you mentioned that presenting the data for volatile organics, lead scavengers, and fuel oxygenates in less than "<" rather than "ND" is needed to judge the appropriateness of eliminating these compounds from future analysis. For ease of review, please see the attached tables, where the data for groundwater are presented in less than "<" rather than "ND".

Regarding the well diagram, I revised the diagram to shorten the screen to 10 feet. That is, the screen extends from 8 feet below surface grade to 18 feet below surface grade (Figure 8). Such a screen is needed to capture seasonal groundwater elevation fluctuation and floating product, if it exists. The field condition during drilling may dictate minor adjustment of the well construction. Also, as discussed, we will have monitoring wells MW-2 and MW-3, located in the highly impacted areas, constructed as 4" inch wells rather than 2" wells. Such construction of 4" wells will allow the extraction of additional product (if it exists) and contaminated water from these wells during sampling events. Monitoring wells MW-1 and MW-4 will be 2" wells.

Please let me know in an email if you have any additional comments or concern.

Thank you for your help and insight in executing this project.

Regards,

Sami Malaeb, P.E., R.E.A.
TEL: (925) 858-9608
Email: s.malaeb@comcast.net

From: Detterman, Mark, Env. Health [<mailto:Mark.Detterman@acgov.org>]
Sent: Thursday, May 31, 2012 5:15 PM
To: 'Sami Malaeb'
Cc: 'rbatiste@eec-corp.com'; 'colisa@me.com'; 'britpete@aol.com'
Subject: RE: 2145 35th Avenue, Oakland, CA - Petroleum Hydrocarbons in Water - Calculated Groundwater Flow Direction - Proposed Well Locations - Well Diagram -

Hi all,

A complete email this time...sorry for the email recall.

I've had a chance to review the data packages that Sami sent and wanted to provide a response. My review included the following items:

Figure 3 Groundwater Elevation and Flow Directions
Figure 4 Depiction of Petroleum Hydrocarbons in Groundwater
Figure 5 Proposed Well Locations
Figure 6 Proposed Well Diagram Rev 05.28.12
Bore logs for P1 to P4, and BH-5 to BH-15

Table 1 Soil, Dispenser and Piping, TPH, TEPH, PCBS, BTEX
Table 2 Soil, Dispenser and Piping, Fuel Oxygenates and Lead Scavengers
Table 3 Soil, Dispenser and Piping VOCs 8260
Table 4 Soil, Dispenser and Piping, Five Metals
Table 5 Soil, Borings, TPH, TEPH, BTEX, PCBs

Please use this email to document that ACEH is in **general concurrence with the revised proposed well locations** as proposed in Figure 5.

In regards to well screens Figure 6 specified a static **well screen interval** with a 12 foot screen interval. ACEH requires shorter screen intervals in order to collect more representative groundwater samples, generally with no more than a 5 foot sand interval; however, ACEH also recognizes that fully screened water-bearing zones are appropriate in thinner permeable zones. ACEH requests an effort to minimize the screen length at each well location to the extent possible, with well screens minimally longer than the water-bearing zone, including the capillary fringe. If longer screen intervals are judged appropriate well clusters or CMT multilevel wells may be appropriate.

ACEH may also be in general agreement with our conversations that full scan VOC by EPA8260, and with the exception of MTBE all fuel oxygenates can be eliminated from future groundwater; however, currently only has generalized "ND" concentration data, and not "less than" (<) data to judge the appropriateness of the detection limit achieved by the laboratory. This was partly a short hand way to express the data on figures. **If this data can be provided ACEH may be able to make this determination to eliminate these analytes.** Our discussion also mentioned naphthalene and we are in agreement that it should continue to be included in the analytical suite. All other analytes should continue to be included in the analytical suite.

Should you have any questions, please let me know.

Mark Detterman
Senior Hazardous Materials Specialist, PG, CEG
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502
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From: Sami Malaeb [<mailto:s.malaeb@comcast.net>]
Sent: Monday, May 28, 2012 3:28 PM
To: Detterman, Mark, Env. Health
Cc: rbatiste@eec-corp.com; colisa@me.com; britpete@aol.com
Subject: 2145 35th Avenue, Oakland, CA - Petroleum Hydrocarbons in Water - Calculated Groundwater Flow Direction - Proposed Well Locations - Well Diagram -

Hi Mark:

I think you are correct. There is more than one groundwater flow direction calculated from the temporary piezometers (see the attached Figure 3). The calculated flow direction ranges from southeast to northeast. However, the topographic slope is towards southwest. I believe the calculated groundwater flow direction from these temporary piezometers is inconclusive. There is a possibility that there was no full recovery of water in one or more of these temporary piezometers. It is likely that the groundwater flow will follow the topography of the area, towards the southwest.

I proposed the locations of the four wells in the attached Figure 5. Additional wells are needed in the future. Please note the locations of the well are slightly different from what I proposed in a previous email. I placed a well near the

center of the main plume. Also, I placed a well upgradient for better triangulation and calculation of the groundwater flow direction.

Also, I proposed the well diagram in the attached Figure 6.

For your reference, Figure 4 depicts petroleum hydrocarbons in groundwater.

Let us discuss at your convenience.

Regards,

Sami Malaeb, P.E., R.E.A.

TEL: (925) 858-9608

Email: s.malaeb@comcast.net

TABLE 11
SUMMARY OF CHEMICAL ANALYSES FOR PURGEABLE ORGANICS BY GC/MS
GRAB GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35TH Avenue
Oakland, California

Sample ID	Description	Date Sampled	Freon 12 (ug/l) ⁽¹⁾	Chloro-methane (ug/l)	Vinyl Chloride (ug/l)	Bromoethane (ug/l)	Chloro-ethane (ug/l)	Trichloro-Fluoro-methane (ug/l)	Acetone (ug/l)	Freon 113 (ug/l)	1,1-Dichloro ethene (ug/l)	Mehylene Chloride (ug/l)
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<7.1	<7.1	<3.6	<7.1	<7.1	<7.1	<71	<14	<3.6	<71
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
P4-W	Shallow groundwater sample from boring P4	01/25/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<10	<10	<5.0	<10	<10	<10	<100	<20	<5.0	<100
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	16	<2.0	<0.5	<10
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<13	<13	<6.3	<13	<13	<13	<130	<25	<6.3	<130
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<5.0	<5.0	<2.5	<5.0	<5.0	<5.0	<50	<10	<2.5	<50
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<2.5	<2.5	<1.3	<2.5	<2.5	<2.5	<25	<5.0	<1.3	<25
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<10	<2.0	<0.5	<10
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<1.4	<1.4	<0.7	<1.4	<1.4	<1.4	17	<2.9	<0.7	<14
Residential land use Groundwater, drinking water ⁽³⁾			--	41	0.5	9.8	12	--	1,500	--	6.0	5.0
Residential land use Groundwater, non-drinking water ⁽⁴⁾			--	41	3.8	160	12	--	1,500	--	25	2,200

TABLE 11 (Continue)
SUMMARY OF CHEMICAL ANALYSES FOR PURGEABLE ORGANICS BY GC/MS
GRAB GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35TH Avenue
Oakland, California

Sample ID	Description	Date Sampled	Carbon Disulfide (ug/kg)	MTBE (ug/kg)	Trans-1,2-Dichloro ethene (ug/kg)	Vinyl Acetate (ug/kg)	1,1-Dichloro ethane (ug/kg)	2-Butanone (ug/kg)	Cis-1,2-Dichloro ethene (ug/kg)	2,2-Dichloro propane (ug/kg)	Chloroform (ug/kg)	Bromo-Chloro methane (ug/kg)
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<3.6	<3.6	<3.6	<71	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
P4-W	Shallow groundwater sample from boring P4	01/25/2012	0.8	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<5.0	<5.0	<5.0	<100	<5.0	<100	<5.0	<5.0	<5.0	<5.0
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<6.3	<6.3	<6.3	<130	<6.3	<130	<6.3	<6.3	<6.3	<6.3
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<2.5	<2.5	<2.5	<50	<2.5	<50	<2.5	<2.5	<2.5	<2.5
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<1.3	<1.3	<1.3	<25	<1.3	<25	<1.3	<1.3	<1.3	<1.3
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<0.5	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	3.6	<0.5	<0.5	<10	<0.5	<10	<0.5	<0.5	<0.5	<0.5
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<0.7	<0.7	<0.7	<14	<0.7	<14	<0.7	<0.7	<0.7	<0.7
Residential land use Groundwater, drinking water ⁽³⁾			--	5.0	10	--	5.0	4,200	6.0	5.0	70	--
Residential land use Groundwater, non-drinking water ⁽⁴⁾			--	1,800	590	--	47	14,000	590	100	330	--

TABLE 11 (Continue)
SUMMARY OF CHEMICAL ANALYSES FOR PURGEABLE ORGANICS BY GC/MS
GRAB GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35TH Avenue
Oakland, California

Sample ID	Description	Date Sampled	1,1,1-Trichloroethane (ug/kg)	1,1-Dichloro propene (ug/kg)	Carbon Tetra chloride (ug/kg)	1,2-Dichloro ethane (ug/kg)	Benzene (ug/kg)	Trichloro ethene (ug/kg)	1,2-Dichloro propane (ug/kg)	Bromo dichloro-methane (ug/kg)	Dibromo-methane (ug/kg)
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<3.6	<3.6	<3.6	<3.6	78	<3.6	<3.6	<3.6	<3.6
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
P4-W	Shallow groundwater sample from boring P4	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<5.0	<5.0	<5.0	<5.0	570	<5.0	<5.0	<5.0	<5.0
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<0.5	<0.5	<0.5	<0.5	2.9	<0.5	<0.5	<0.5	<0.5
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<0.5	<0.5	<0.5	<0.5	8.6	<0.5	<0.5	<0.5	<0.5
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<6.3	<6.3	<6.3	<6.3	36	<6.3	<6.3	<6.3	<6.3
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<2.5	<2.5	<2.5	<2.5	27	<2.5	<2.5	<2.5	<2.5
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<0.7	<0.7	<0.7	<0.7	1.0	<0.7	<0.7	<0.7	<0.7
Residential land use Groundwater, drinking water ⁽³⁾			62	0.5	0.5	0.5	1.0	5.0	5.0	100	0.05
Residential land use Groundwater, non-drinking water ⁽⁴⁾			62	24	9.3	200	46	360	100	170	170

TABLE 11 (Continue)
SUMMARY OF CHEMICAL ANALYSES FOR PURGEABLE ORGANICS BY GC/MS
GRAB GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35TH Avenue
Oakland, California

Sample ID	Description	Date Sampled	4-Methyl-1-2-pentanone (ug/kg)	Cis-1,3-Dichloro propene (ug/kg)	Toluene (ug/kg)	Trans-1,3-Dichloro propene (ug/kg)	1,1,2-Trichloro ethane (ug/kg)	2-Hexanone (ug/kg)	1,3-Dichloro propane (ug/kg)	Tetra-chloro ethene (ug/kg)	Dibromo chloro-methane (ug/kg)
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<71	<3.6	19	<3.6	<0.5	<71	<3.6	<3.6	<3.6
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
P4-W	Shallow groundwater sample from boring P4	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<100	<5.0	130	<5.0	<5.0	<100	<5.0	<5.0	<5.0
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<10	<0.5	1.1	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<130	<6.3	21	<6.3	<6.3	<130	<6.3	<6.3	<6.3
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<50	<2.5	11	<2.5	<2.5	<50	<2.5	<2.5	<2.5
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<25	<1.3	<1.3	<1.3	<1.3	<25	<1.3	<1.3	<1.3
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	<10	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<14	<0.7	<0.7	<0.7	<0.7	<14	<0.7	<0.7	<0.7
Residential land use Groundwater, drinking water ⁽³⁾			120	0.5	40	0.5	5.0	--	--	120	100
Residential land use Groundwater, non-drinking water ⁽⁴⁾			170	24	130	24	350	--	--	120	170

TABLE 11 (Continue)
SUMMARY OF CHEMICAL ANALYSES FOR PURGEABLE ORGANICS BY GC/MS
GRAB GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35TH Avenue
Oakland, California

Sample ID	Description	Date Sampled	1,2-Dibromoethane (ug/kg)	Choloro benzene (ug/kg)	1,1,1,2-Tetrachloroethane (ug/kg)	Ethyl-benezene (ug/kg)	m,p-Xylenes (ug/kg)	o-Xylenes (ug/kg)	Styrene (ug/kg)	Bromoform (ug/kg)	Isopropyl-benzene (ug/kg)	1,1,2,2-Tetra chloethane (ug/kg)
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<3.6	<3.6	<3.6	89	80	<3.6	<3.6	<3.6	120	<3.6
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
P4-W	Shallow groundwater sample from boring P4	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<5.0	<5.0	<5.0	1,600	720	67	<5.0	<10	140	<5.0
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<0.5	<0.5	<0.5	43	18	0.7	<0.5	<1.0	4.8	<0.5
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<1.0	31	<0.5
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<6.3	<6.3	<6.3	130	44	<6.3	<6.3	<13	140	<6.3
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<2.5	<2.5	<2.5	340	160	4.4	<2.5	<5.0	<2.5	<2.5
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<0.7	<0.7	<0.7	1.7	1.0	<0.7	<0.7	<1.4	24	<0.7
Residential land use Groundwater, drinking water ⁽³⁾			0.05	25	1.3	30	10	10	10	100	--	1.0
Residential land use Groundwater, non-drinking water ⁽⁴⁾			150	25	190	43	50	50	100	1,100	--	190

TABLE 11 (Continue)
SUMMARY OF CHEMICAL ANALYSES FOR PURGEABLE ORGANICS BY GC/MS
GRAB GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35TH Avenue
Oakland, California

Sample ID	Description	Date Sampled	1,2,3- Trichloro propane (ug/kg)	Propyl benzene (ug/kg)	Bromo benzene (ug/kg)	1,3,5- Trimethyl benzene (ug/kg)	2-Chro toluene (ug/kg)	4-Chro toluene (ug/kg)	tert- butyl benzene (ug/kg)	1,2,4- Trimethyl- benzene (ug/kg)	sec- Butyl benzene (ug/kg)	Para- Isopropyl Toluene (ug/kg)
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<3.6	360	<3.6	21	<3.6	<3.6	<3.6	6.1	14	6.0
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
P4-W	Shallow groundwater sample from boring P4	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<5.0	310	<5.0	280	<5.0	<5.0	9.1	520	17	12
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<0.5	13	<0.5	8.4	<0.5	<0.5	0.5	29	1.2	0.7
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<0.5	63	<0.5	<0.5	<0.5	<0.5	4.7	<1.0	11	<0.5
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<6.3	470	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	12	<6.3
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<2.5	93	<2.5	44	<2.5	<2.5	<2.5	210	7.8	4.2
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<0.7	82	<0.7	1.7	<0.7	<0.7	1.4	<0.7	4.7	<0.7
Residential land use Groundwater, drinking water ⁽³⁾			--	--	--	--	--	--	--	--	--	--
Residential land use Groundwater, non-drinking water ⁽⁴⁾			--	--	--	--	--	--	--	--	--	--

TABLE 11 (Continue)
SUMMARY OF CHEMICAL ANALYSES FOR PURGEABLE ORGANICS BY GC/MS
GRAB GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35TH Avenue
Oakland, California

Sample ID	Description	Date Sampled	1,3-Dichloro-benzene (ug/kg)	1,4-Dichloro-benzene (ug/kg)	n-Butyl benzene (ug/kg)	1,2-Dichloro benzene (ug/kg)	1,2-Dibromo-3-Chloro propane (ug/kg)	1,2,4-Trichloro benzene (ug/kg)	Hexa-Chloro-butadiene (ug/kg)	Naphtalene (ug/kg)	1,2,3-Trichloro-benzene
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<3.6	<3.6	110	<3.6	<3.6	<3.6	<3.6	680	<3.6
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
P4-W	Shallow groundwater sample from boring P4	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<5.0	<5.0	<5.0	<5.0	<20	<5.0	<2.0	400	<5.0
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<0.5	<0.5	4.7	<0.5	<2.0	<0.5	<2.0	4.7	<0.5
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<0.5	<0.5	32	<0.5	<0.5	<0.5	<0.5	17	<0.5
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<6.3	<6.3	<6.3	<6.3	<25	<6.3	<25	1,200	<6.3
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<2.5	<2.5	35	<2.5	<10	<2.5	<10	69	<2.5
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<1.3	<1.3	<1.3	<1.3	<5.0	<1.3	<5.0	<5.0	<1.3
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<0.7	<0.7	10	<0.7	<2.9	<0.7	<2.9	100	<0.7
Residential land use Groundwater, drinking water ⁽³⁾			65	5.0	--	10	0.2	5.0	0.45	17	5.0
Residential land use Groundwater, non-drinking water ⁽⁴⁾			65	15	--	14	20	25	0.93	24	25

ug/l ⁽¹⁾ = Microgram per liter or part per billion

bgs ⁽²⁾ = Below ground surface

Bold = Concentration presented in bold where such a value is at or exceeds one of the environmental screening levels (ESLs) listed

-- = No established value listed.

⁽³⁾ = Tier 1 Environmental Screening Levels (ESLs), Groundwater Screening Levels (ESLs), Groundwater is Current or Potential Source of Drinking Water (mg/kg), (Table F1a), Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Prepared by: California Regional Water Quality Control Board, San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, California 94612, Interim Final November 2007, (Revised May 2008).

⁽⁴⁾ = Tier 1 Environmental Screening Levels (ESLs), Groundwater Screening Levels (ESLs), Groundwater is not Current or Potential Source of Drinking Water (mg/kg), (Table F-1b), Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Prepared by: California Regional Water Quality Control Board, San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, California 94612, Interim Final - November 2007, (Revised May 2008).

TABLE 10
SUMMARY OF CHEMICAL ANALYSES FOR FUEL OXYGENATES AND LEAD SCAVENGERS
GROUNDWATER SAMPLES COLLECTED FROM THE BOREHOLES
2145 35th Avenue
Oakland, California

Sample ID	Description	Date Sampled	tert-Butyl Alcohol (TBA) (µg/l) ⁽¹⁾	Isopropyl Ether (DIPE) (µg/l)	Ethyl tert-Butyl Ether (ETBE) (µg/l)	Methyl tert-Amyl Ether (TAME) (µg/l)	Methyl tert-Butyl Ether (MTBE) (µg/l)	Ethylene Dibromide (EDB) (µg/l)	1,2-dichloroethane (DCA) (µg/l)
P1-W	Shallow groundwater sample from boring P1	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
P2-W	Shallow groundwater sample from boring P2	01/25/2012	<71	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6
P3-W	Shallow groundwater sample from boring P3	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
P4-W	Shallow groundwater sample from boring P4	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH5-W	Shallow groundwater sample from boring BH5	02/06/2012	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
BH5-W1	Groundwater sample from boring BH5 at ~25' bgs ⁽²⁾	02/06/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH6-W	Shallow groundwater sample from boring BH6	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH7-W	Shallow groundwater sample from boring BH7	01/25/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH8-W	Shallow groundwater sample from boring BH8	01/25/2012	<130	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3
BH9-W	Shallow groundwater sample from boring BH9	02/06/2012	<50	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
BH10-W	Shallow groundwater sample from boring BH10	02/06/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH11-W	Shallow groundwater sample from boring BH11	02/08/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH12-W	Shallow groundwater sample from boring BH12	02/06/2012	<25	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
BH13-W	Shallow groundwater sample from boring BH13	02/08/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH14-W	Shallow groundwater sample from boring BH14	02/08/2012	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH15-W	Shallow groundwater sample from boring BH15	02/08/2012	<14	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Residential land use Groundwater, drinking water ⁽³⁾			12	--	--	--	5.0	0.05	0.5
Residential land use Groundwater, non-drinking water ⁽⁴⁾			18,000	--	--	-	1,800	150	200

µg/l⁽¹⁾ = Microgram per Liter

bgs⁽²⁾ = Below Ground Surface

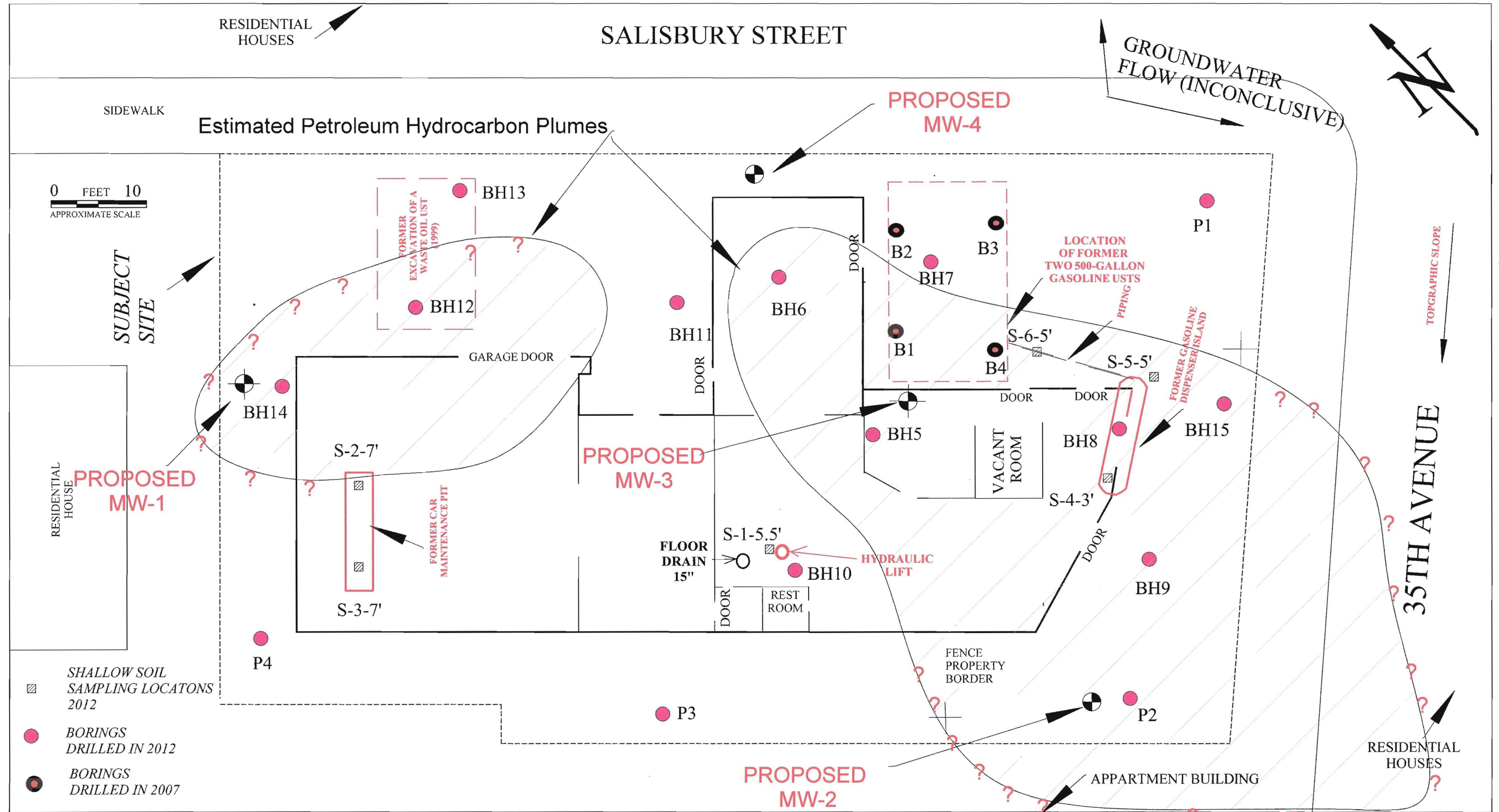
⁽³⁾ = Tier 1 Environmental Screening Levels (ESLs), Groundwater Screening Levels (ESLs), Groundwater is Current or Potential Source of Drinking Water (mg/kg), (Table F-1a), Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Prepared by: California Regional Water Quality Control Board, San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, California 94612, Interim Final November 2007, (Revised May 2008).

⁽⁴⁾ = Tier 1 Environmental Screening Levels (ESLs), Groundwater Screening Levels (ESLs), Groundwater is not Current or Potential Source of Drinking Water (mg/kg), (Table F-1b), Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Prepared by:

California Regional Water Quality Control Board, San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, California 94612, Interim Final - November 2007, (Revised May 2008).

(--) Not determined or not available

Note: reporting limits of some compounds listed in the above table are higher than their respective ESLs



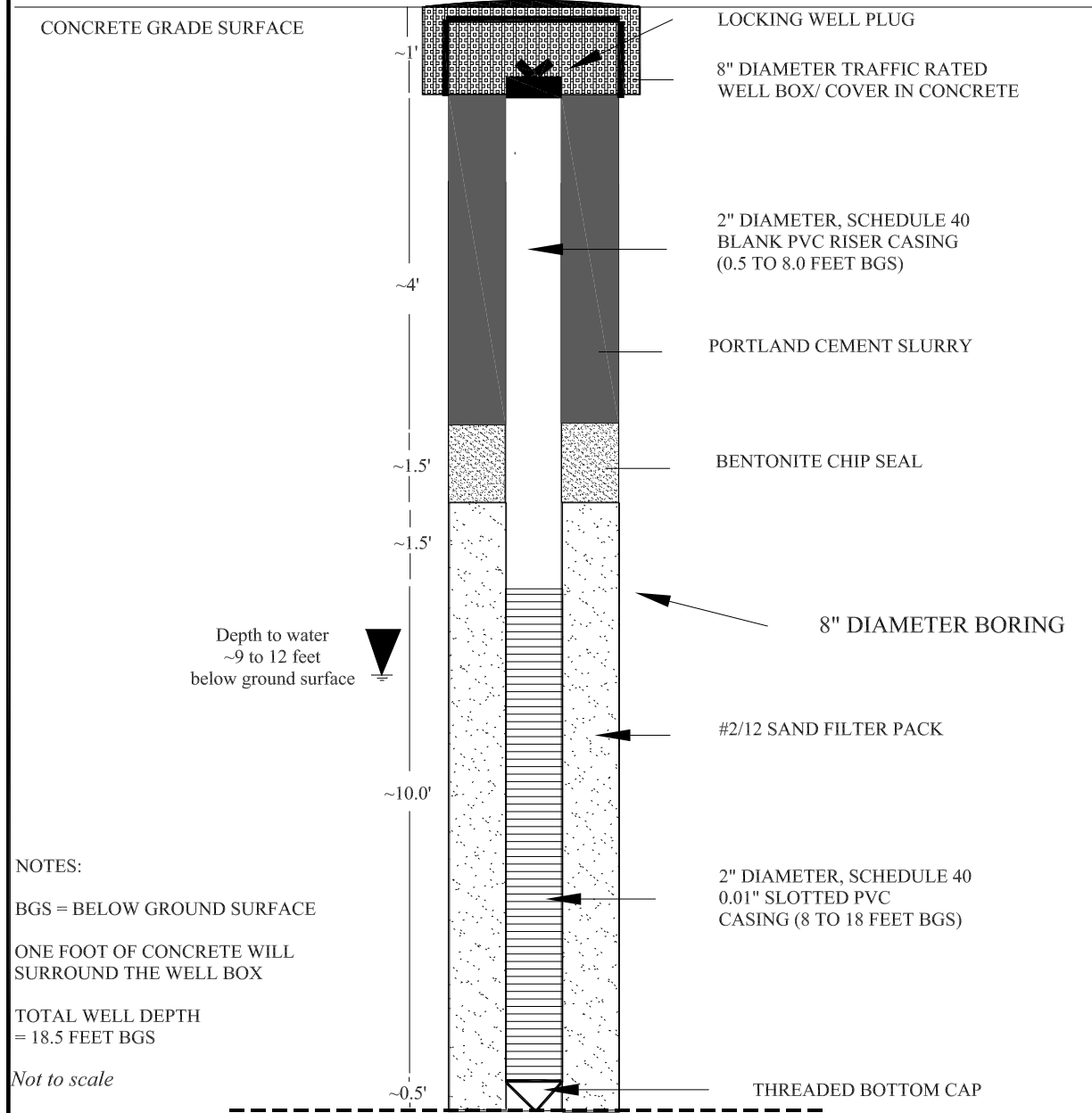
1485 BAYSHORE BOULEVARD, SUITE 374
SAN FRANCISCO, CA 94124

PETROLEUM HYDROCARBONS IN GROUNDWATER
AND PROPOSED MONITORING WELLS
2145 35TH AVENUE, OAKLAND, CALIFORNIA

FIGURE 5
APRIL 2012

GROUNDWATER MONITORING WELL
CONSTRUCTION SPECIFICATIONS

POSITIVE GRADE FOR WATER
TO FLOW AWAY FROM THE WELL BOX



NOTES:

BGS = BELOW GROUND SURFACE

ONE FOOT OF CONCRETE WILL SURROUND THE WELL BOX

TOTAL WELL DEPTH = 18.5 FEET BGS

Not to scale



1485 BAYSHORE BOULEVARD, SUITE 374
SAN FRANCISCO, CA 94124

2145 35th AVENUE
OAKLAND, CALIFORNIA

(06/01/12) BY SM
NOT TO SCALE

FIGURE 8
PROPOSED WELL
CONSTRUCTION DIAGRAM