



Oregon

Theodore R. Kulongoski, Governor

file
Department of Environmental Quality

Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

Portland, OR 97201-4987

(503) 229-5263

Fax: (503) 229-6945

TTY: (503) 229-5471

March 30, 2009

JOHN O'DONOVAN
CITY OF PORTLAND BES
1120 SW 5TH AVE ROOM 1000
PORTLAND OR 97204-1912

Re: Ladd Inn Tavern
File No. 26-08-0037

Dear Mr. O'Donovan:

The Department of Environmental Quality (DEQ) has completed its review of the information submitted to date concerning the underground storage tank (UST) decommissioning conducted at 1204 SE Clay Street in Portland, Oregon. DEQ has determined that the project appears to have met the requirements of Oregon Administrative Rules (OAR) 340-122-0205 through 340-122-0360. No further action is required at this time.

This determination is a result of our evaluation and judgment based on the regulations and facts as we now understand them:

1. Two 550-gallon gasoline USTs were discovered beneath the sidewalk along SE Clay Street at the intersection of SE 12th Avenue during a public works project conducted by the City of Portland. The empty and abandoned USTs were excavated by Universal Applicators on January 9, 2008 and shipped to Metro Metals Northwest in Portland. Twenty gallons of oily rinsewater from the USTs were shipped to Oregon Re-Refining Company (ORRCO) in Portland for recycling and disposal.
2. Once the USTs were removed, Universal collected five confirmation soil samples. One soil sample was collected beneath each end of each UST at a depth of eight feet below ground surface (bgs). The fifth sample was collected at four feet bgs from the south end of the west UST. All five samples were analyzed for petroleum products by the DEQ-approved Total Petroleum Hydrocarbon Identification method (NWTPH-HCID). Contamination consistent with gasoline, diesel, and heavy oil was detected beneath the north end of the west UST. Gasoline and diesel were detected beneath the south end of the east UST, and gasoline was detected beneath the south end of the west UST at 8 feet bgs. (The laboratory identified the two diesel detections as being due to overlap from the gasoline).
3. The three contaminated soil samples were further analyzed for gasoline, diesel, and oil by the DEQ-approved methods NWTPH-Dx and NWTPH-Gx. Gasoline and diesel were detected in all three samples, with the highest concentrations being beneath the north end of the west UST. Gasoline was identified in this sample at a concentration of 1,270 parts per million (ppm). Diesel was detected in the sample at 265 ppm, and heavy oil was present at 244 ppm.

4. A third UST was discovered beneath the sidewalk adjacent to the first two on January 14, 2008. The 550-gallon UST, also believed to have stored gasoline, was excavated on January 23 and shipped to Metro Metals Northwest for recycling. Approximately 300 gallons of sludges and rinsewater were taken to ORRCO for recycling and disposal.
5. Confirmation soil samples were collected beneath the ends of the UST. Gasoline (at 387 ppm) and diesel (at 178 ppm) were detected beneath the north end of the UST. Gasoline (6,560 ppm), diesel (4,290 ppm), and heavy oil (3,680 ppm) were detected beneath the south end of the UST. The south sample was further analyzed for a variety of petroleum constituents, including polynuclear aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs). Over a dozen constituents were detected, including naphthalene (12.2 ppm), 1,2,4-trimethylbenzene (38.9 ppm), and 1,3,5-trimethylbenzene (14.7 ppm).
6. Universal Applicators collected a final set of soil samples on January 30, 2008 to determine the extent of the contamination. One sample was collected beneath the contaminated south sample from UST #3 at a depth of 110 inches (about nine feet) bgs. The other four samples were collected in a circle around the excavation pit, also at depths of 110 inches bgs. All five samples were analyzed for gasoline and diesel. No contaminants were detected.
7. No petroleum-contaminated soil (PCS) has been removed from the site. Based on the sampling results, Universal concluded that the PCS is present in a layer about one foot thick (between eight and nine feet bgs) and extends up to 26 feet laterally, for a total volume of approximately 16 cubic yards.
8. The site is currently zoned Storefront Commercial. However, given that much of the surrounding area is zoned residential, Universal Applicators concluded that redevelopment of the site as urban residential was a reasonably likely future beneficial use.
9. Universal determined that future on-site residents were unlikely to come into direct contact with the contamination, given that the PCS is at depth (eight feet bgs) and located beneath the sidewalk. (The contaminant concentrations are too low to present an unacceptable threat to construction and excavation workers). Universal also determined that the PCS was unlikely to pose a threat by leaching to groundwater and impacting a domestic water supply well. No water supply wells were identified within ¼ mile of the site, and the area is served by the City of Portland's municipal water supply system. (The nearest identified well shows a static groundwater level of 20 feet bgs).

10. Gasoline, at a maximum detected concentration of 6,560 ppm, and 1,3,5-trimethylbenzene, with a maximum concentration of 14.7 ppm, exceed DEQ's risk-based standards of 140 ppm and 12 ppm, respectively, for vapor intrusion into buildings under an urban residential exposure scenario. In addition, the gasoline concentration exceeds DEQ's risk-based standard of 4,500 ppm for volatilization to outdoor air for urban residential exposures.
11. Using a DEQ-approved spreadsheet, a site-specific cleanup standard for the gasoline was calculated based on the actual concentration of constituents in the product, rather than the generic concentrations in DEQ's Risk-Based Cleanup (RBC) standards. The calculations showed that the gasoline does not in fact pose a vapor threat to either indoor or outdoor air, due to relatively low levels of volatiles in the product compared to generic gasoline. Therefore, DEQ has determined that no further action is necessary with regard to the gasoline contamination in the soil at this site.
12. The maximum detected concentration of 1,3,5-trimethylbenzene at this site exceeds DEQ's RBC standard for vapor intrusion into buildings under an urban residential exposure scenario. However, confirmation sampling has shown that contaminated soil at this site is limited in extent, extending less than one foot deep and less than seven feet in radius (the distance to the adjacent UST). Given the limited volume of contamination, and the fact that the maximum detected concentration of 14.7 ppm is only slightly above the RBC of 12 ppm, DEQ has determined that actual amount of soil with 1,3,5-trimethylbenzene concentrations above 12 ppm is too small to pose an actual threat of indoor air contamination. Therefore, no remediation of the 1,3,5-trimethylbenzene soil contamination at this site is necessary.

DEQ's determination that no further action is necessary will not be applicable if new or undisclosed facts show that the investigation did not comply with the referenced rules. DEQ's determination also does not apply to any conditions at the site other than the release of the petroleum products specifically addressed in this letter.

Please note that pursuant to OAR 340-122-0360(2), a copy of your report from Universal Applicators must be retained until ten (10) years after you transfer your property. We recommend that a copy of the report be kept with your permanent records.

Your efforts to comply with the regulations to ensure that your property has been adequately cleaned up have been appreciated.

Ladd Inn, File #26-08-0037
March 30, 2009
Page 4

If you have any questions, please feel free to contact me at (503) 229-5369.

Sincerely,

Kevin Dana

Kevin Dana
UST Cleanup Specialist

cc: Robert A. Fisher
Universal Applicators Inc.
2357 SE 50th Ave
Portland OR 97215

Rosemary Gray
1204 SE Clay St
Portland OR 97214

(kpd:KPD)

DANA Kevin

From: KENT Lynne
Sent: Monday, March 30, 2009 8:42 AM
To: DANA Kevin
Subject: FW: Ladd Inn Tavern site closed

FYI -

Lynne

From: HUNTER Laurie
Sent: Friday, March 27, 2009 5:19 PM
To: ISMERIO Dawn
Cc: KORTENHOF Mike; KENT Lynne; CLARK Liz
Subject: Ladd Inn Tavern site closed

FYI....

We have received the final payment on the Ladd Inn Tavern (26-08-0037) L54215 site. I'm closing the business office and CRIS account with a \$0.00 balance.

Laurie Hunter
DEQ - Accounting
Phone: (503) 229-5698 Fax: (503) 229-6730
E-mail: hunter.laurie@deq.state.or.us



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Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

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October 28, 2008

JOHN O'DONOVAN
CITY OF PORTLAND BES
1120 SW 5TH AVE ROOM 1000
PORTLAND OR 97204-1912

Re: Ladd Inn Tavern
File No. 26-08-0037

Dear Mr. O'Donovan:

The Department of Environmental Quality (DEQ) has received and reviewed Universal Applicators' February 26, 2008 "UST Cleanup Activities" report for the Ladd Inn Tavern site, located at 1204 SE Clay Street in Portland, Oregon. Based on information in the report, it appears the site has met the appropriate cleanup requirements for a No Further Action (NFA) letter.

You should see a final invoice for this project in approximately 60 days. Once the final invoice is paid, DEQ will send you the NFA letter.

If you have any questions, please feel free to contact me at (503) 229-5369.

Sincerely,

Kevin Dana

Kevin Dana
UST Cleanup Specialist

cc: Robert A. Fisher
Universal Applicators Inc.
2357 SE 50th Ave.
Portland OR 97215

Rosemary Gray
1204 SE Clay St.
Portland OR 97214

(kpd:KPD)

DANA Kevin

From: POULSEN Mike
Sent: Wednesday, July 30, 2008 3:58 PM
To: DANA Kevin
Subject: Ladd's Inn UST

Kevin –

I have reviewed the UST Cleanup Activities for the City of Portland at the Property of: Rosemary Gray located at: 1204 S.E. Clay Street, Portland, Oregon. The following are my draft comments. I want to include my calculations, but I haven't been able to get them organized. I'll do that when I get back from vacation on 11 August. I left the report on my desk if you need it.

- Mike

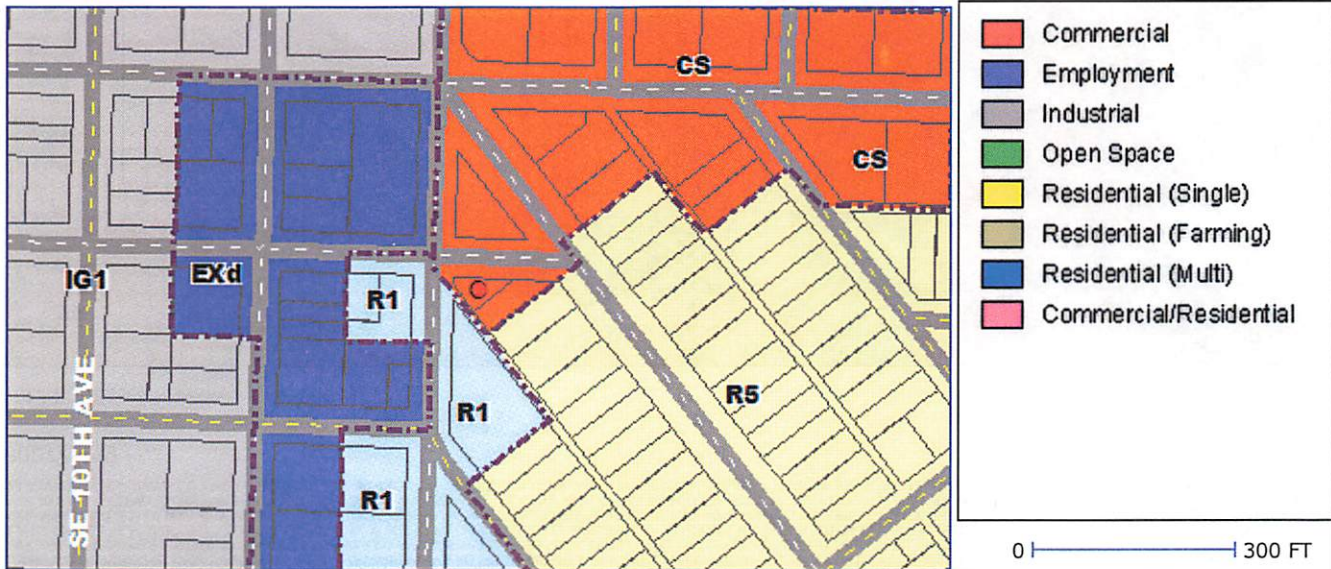
The calculation of site-specific RBCs includes an inappropriate modification of the thickness of contaminated soils under buildings. The contaminated soil is currently not beneath a building, so there is no current exposure. However, the assumption for the vapor transport pathway should be that a building could be placed over the contaminated soil in the future. Including a reasonable thickness of contaminated soil beneath the building will result in vapor transport RBCs that show unacceptable risk. However, information in the report can be used to further refine the calculations.

The TPH RBC spreadsheet can be used to calculate a site-specific RBC using constituent data along with TPH data. Using this approach, the RBC values for vapor transport show acceptable risk. The report focuses on vapor transport as the only pathway of interest. However, it may also be possible that soil at the site is uncovered and used in a residential or urban residential setting. Unless this possibility is considered unreasonable, it should be included as a potential future exposure pathway. If potential future soil contact is considered a relevant pathway, TPHd concentrations may be considered unacceptable by a small margin. It is therefore important to consider the reasonableness of this pathway.

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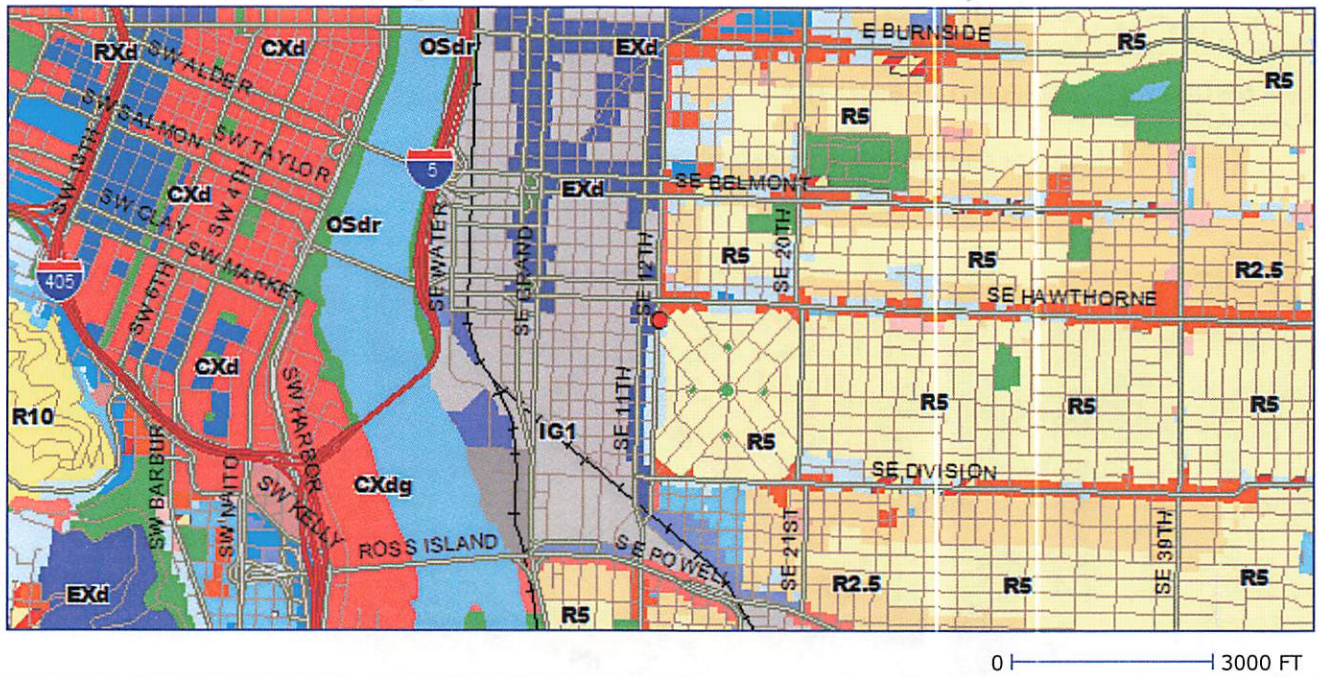
Zoning



Zone	CS (Storefront Commercial)	Plan District	
Overlay	n/a	NRMP District	
Comp Plan	UC	Historical Resource Type	
Comp Plan Overlay		Historic District	Ladd's Addition Historic
Zoning Map	3231	Conservation District	
Urban Renewal Area	n/a	Wellhead Protection Area	No

Historical Resource Information

District Classification	Noncontributing	Year Built	
Historic Name		Architect	
Common Name		Style	



City of Portland, Corporate GIS

6/24/2008

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Commercial Zones - Printable Version**CN1 (Neighborhood Commercial 1) zone**

The Neighborhood Commercial 1 (CN1) zone is intended for small sites in or near dense residential neighborhoods. The zone encourages the provision of small scale retail and service uses for nearby residential areas. Some uses which are not retail or service in nature are also allowed so a variety of uses may locate in existing buildings. Uses are restricted in size to promote a local orientation and to limit adverse impacts on nearby residential areas. Development is intended to be pedestrian-oriented and compatible with the scale of surrounding residential areas. Parking areas are restricted, since their appearance is generally out of character with the surrounding residential development and the desired orientation of the uses.

CN2 (Neighborhood Commercial 2) zone

The Neighborhood Commercial 2 (CN2) zone is intended for small commercial sites and areas in or near less dense or developing residential neighborhoods. The emphasis of the zone is on uses which will provide services for the nearby residential areas, and on other uses which are small scale and have little impact. Uses are limited in intensity to promote their local orientation and to limit adverse impacts on nearby residential areas. Development is expected to be predominantly auto accommodating, except where the site is adjacent to a transit street or in a Pedestrian District. The development standards reflect that the site will generally be surrounded by more spread out residential development.

CO1 (Office Commercial 1) zone

The Office Commercial 1 (CO1) zone is used on small sites in or near residential areas or between residential and commercial areas. The zone is intended to be a low intensity office zone that allows for small scale offices in or adjacent to residential neighborhoods. The allowed uses are intended to serve nearby neighborhoods and/or have few detrimental impacts on the neighborhood. Development is intended to be of a scale and character similar to nearby residential development to promote compatibility with the surrounding area. Development should be oriented to pedestrians along transit streets and in Pedestrian Districts.

CO2 (Office Commercial 2) zone

The Office Commercial 2 (CO2) zone is a low and medium intensity office zone generally located on Major City Traffic Streets as designated by the Transportation Element of the Comprehensive Plan. Uses are limited to those in the Office category and may have a local or regional emphasis. The zone is intended to prevent the appearance of strip commercial development by allowing office uses but not other commercial uses. Commercial uses are also restricted to limit detrimental impacts on nearby residential areas. Development is expected to be somewhat auto-accommodating. Where the site is adjacent to a transit street or in a Pedestrian District, development should be oriented to pedestrians. The development standards allow for more intense development than in the CO1 zone, but not so intense as the CG zone.

CM (Mixed Commercial/Residential) zone

The Mixed Commercial/Residential (CM) zone promotes development that combines commercial and housing uses on a single site. This zone allows increased development on busier streets without fostering a strip commercial appearance. This development type will support transit use, provide a buffer between busy streets and residential neighborhoods, and provide new housing opportunities in the City. The emphasis of the nonresidential uses is primarily on locally oriented retail, service, and office uses. Other uses are allowed to provide a variety of uses that may locate in existing buildings. Development is intended to consist primarily of businesses on the ground floor with housing on upper stories. Development is intended to be pedestrian-oriented with buildings close to and oriented to the sidewalk, especially at corners.

CS (Storefront Commercial) zone

The Storefront Commercial (CS) zone is intended to preserve and enhance older commercial areas that have a storefront character. The zone intends that new development in these areas will be compatible with this desired character. The zone allows a full range of retail, service and business uses with a local and regional market area. Industrial uses are allowed but are limited in size to avoid adverse effects different in kind or amount than

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commercial uses and to ensure that they do not dominate the character of the commercial area. The desired character includes areas which are predominantly built-up, with buildings close to and oriented towards the sidewalk especially at corners. Development is intended to be pedestrian-oriented and buildings with a storefront character are encouraged.

CG (General Commercial) zone

The General Commercial (CG) zone is intended to allow auto-accommodating commercial development in areas already predominantly built in this manner and in most newer commercial areas. The zone allows a full range of retail and service businesses with a local or regional market. Industrial uses are allowed but are limited in size to avoid adverse effects different in kind or amount than commercial uses and to ensure that they do not dominate the character of the commercial area. Development is expected to be generally auto-accommodating, except where the site is adjacent to a transit street or in a Pedestrian District. The zone's development standards promote attractive development, an open and pleasant street appearance, and compatibility with adjacent residential areas. Development is intended to be aesthetically pleasing for motorists, transit users, pedestrians, and the businesses themselves.

CX (Central Commercial) zone

The Central Commercial (CX) zone is intended to provide for commercial development within Portland's most urban and intense areas. A broad range of uses is allowed to reflect Portland's role as a commercial, cultural and governmental center. Development is intended to be very intense with high building coverage, large buildings, and buildings placed close together. Development is intended to be pedestrian-oriented with a strong emphasis on a safe and attractive streetscape.



Oregon

Theodore R. Kulongoski, Governor

Department of Environmental Quality

Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

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June 18, 2008

JOHN O'DONOVAN
CITY OF PORTLAND BES
1120 SW 5TH AVE ROOM 1000
PORTLAND OR 97204-1912

Re: Ladd Inn Tavern
File No. 26-08-0037

Dear Mr. O'Donovan:

The purpose of this letter is to inform you that I have been assigned as project manager for your underground storage tank (UST) decommissioning and cleanup project located at 1204 SE Clay Street in Portland, Oregon. As a reminder, the Department of Environmental Quality (DEQ) is required by law to recover its costs in reviewing and overseeing work on UST cleanup projects.

If you have any questions regarding DEQ's work on or involvement with your project, please call me at (503) 229-5369. Your efforts in investigating and cleaning up the release from your underground storage tank are appreciated.

Sincerely,

Kevin Dana

Kevin Dana
UST Cleanup Specialist

cc: Robert A. Fisher
Universal Applicators Inc
2357 SE 50th Ave
Portland OR 97215

Rosemary Gray
1204 SE Clay St
Portland OR 97214

(kpd:KPD)



Oregon

Theodore R. Kulongoski, Governor

Department of Environmental Quality

Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

Portland, OR 97201-4987

(503) 229-5263

Fax: (503) 229-6945

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January 14, 2008

DIANA BLUM
6540 CHESSINGTON LN
GLADSTONE OR 97027

RE: Ladd Inn Tavern
File No.: 26-08-0037

On January 11, 2008, a release was reported from an underground storage tank (UST) system at your facility located at 1204 SE Clay Street in Portland, Oregon. As the responsible party for the facility, you are required to clean up the release according to OAR 340-122-0201 through 340-122-0360. These rules require cleaning up the soil, groundwater, surface water and any other media contaminated by petroleum to the appropriate standards or demonstrating that the contamination does not pose a risk to human health or the environment. We are looking forward to working with you to bring this site to closure.

An Initial Report Form for UST Cleanup Projects is enclosed. This form needs to be completed and returned to this office within twenty (20) days from the date the release was reported. An outline of additional reporting requirements that includes due dates for submittals is also enclosed. A copy of the UST Cleanup regulations or an application for a letter of authorization for soil treatment will be provided upon request. As the responsible party, you should be aware of the requirements for cleanup, even if you have hired a qualified contractor or consultant to assist you.

Please reference the DEQ File Number listed above in all future correspondence and reports.

By law, DEQ is required to recover project oversight costs. DEQ oversight begins with the initial site characterization and continues through site closure. Oversight includes activities such as reviewing reports, preparing correspondence, answering technical questions, site inspections, and enforcement actions. **You will be receiving an invoice each month for all oversight activities performed to date.**

DEQ's highest priority for oversight are those sites that pose the greatest hazard to human health, safety and the environment. As a result, many lower environmental priority sites will not be reviewed in detail or receive a final "No Further Action" or "closure" letter from DEQ until the higher priority sites are addressed. However, all projects, simple or complex, require at least some oversight. At a minimum, review is conducted to determine the environmental priority of the cleanup project.

For those responsible parties who desire DEQ oversight regardless of environmental priority, we have developed a Responsible Party Priority Site Program. To receive oversight and more

effectively schedule your project, you will be asked to sign an agreement requesting priority review and confirming your agreement to pay DEQ oversight costs in a timely manner.

Not entering into the Agreement does not release you from responsibility for investigation and/or cleanup of the contamination, nor does it mean that you are exempt from paying for DEQ oversight costs. Please be aware that there may be a waiting list for assignment to the next available project manager, and that these projects are assigned on a first come, first served basis.

Please read the attached information on the cost recovery and invoice process. We have also included information about the Responsible Party Priority Site Program and an agreement, if you are interested in expediting review of your project. You may contact the Land Quality Division at (503) 229-6635 if you have questions about cost recovery.

Thank you for your cooperation and continued efforts to comply with the regulations. **If you have any questions about the regulations and/or your cleanup project, please call (503) 229-5263 and ask to speak to the Underground Storage Tank Duty Officer.**

Sincerely,

A handwritten signature in black ink, appearing to read "M. H. Korten", is positioned above the typed name.

Michael H. Korten, Manager
UST Cleanup and Compliance Section

Enclosures

DANA Kevin

To: UAITANKS@SPIRITONE.COM
Subject: OLPRR Incident Report in Accepted Status. Log Number: 26-08-0037

Your on-line tank data submittal has been reviewed and accepted by the State of Oregon
DEQ. New LUST Incident Log Number: 26-08-0037

Reported by: BOB FISHER
Company Name: UNIVERSAL APPLICATORS INC
Phone Number: 503-236-6359

Site Name: LADD INN TAVERN
Site Address: 1204 SE Clay St
Site County: MULTNOMAH
Site City: PORTLAND
Site Zip Code: 97214
Comments: 2 TANKS IN ROW REMOVED FOR CITY OF PORTLAND SIDEWALK IMPROVEMENT.

Date Received: 1/11/2008
Release Type: UnRegulated

RESPONSIBLE PARTY INFORMATION

First Name:
Diana
Last Name:
Blum
Organization:

City:
Gladstone
Phone:
503-000-0000
Address:
6540 Chessington Ln
State:
OR
Zip:
97027

INVOICE CONTACT INFORMATION

First Name:
John
Last Name:
O'Donovan
Organization:
City of Portland BES
City:
Portland
Phone:
503-823-5861
Address:
1120 SW 5th Ave Room 1000
State:
OR
Zip:
97204-1912

Confirmation: Lab:RP
Discovery: Decommissioning

Cause: Unknown

MEDIA TYPE
Soil

CONTAMINANT TYPE
Diesel (Motor Fuel)
Misc. Gasoline

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Aerial Photo

2006 / '05 / '04 / '03 / '02 / '01

6" / 2' / 4' / 10' / 20'

Streets: [On](#) / [Off](#)Lots: [On](#) / [Off](#)Dot: [On](#) / [Off](#)

0 |—————| 100 FT

City of Portland, Corporate GIS

1/14/2008

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1204 SE CLAY ST PORTLAND, OR 97214

Description	Restaurant
Size	2,032 square feet
Number of Bedrooms	
Bathrooms	



Property Map


Property Value (2007)

Market Value	\$359,280.00
Assessed Value	\$154,870.00

Taxes (2007)

Property Taxes	\$3,377.14
Total Taxes	\$3,377.14

Misc Info

Year Built	1926
Foundation Type	
Interior Finish	
Roof Style	
Roof Cover Type	
Flooring Type	
Heating/AC Type	

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DANA Kevin

From: Oregon DEQ - Do not reply [OregonDEQ@deq.state.or.us]
Sent: Friday, January 11, 2008 11:16 AM
To: DEQTanksReviewNWR
Subject: OLPRR LUST Tank Start Notification for DEQ Staff

New LUST Incident information submitted to State of Oregon DEQ for review.

Contractor : UNIVERSAL APPLICATORS INC
Reported by: BOB FISHER
Phone Number: 503-236-6359

Site Name: Ladd' Inn Tavern
Site Address: 1204 SE Clay Street
Site City: Portland
Site Zip Code: 97214

Site County: Multnomah
Received by State of Oregon DEQ : 1/11/2008 11:16:09 AM.

Review Type		DEQ Office		OLPRR Review		Incident Comments		Contractor Maintenance									
NEW		NWR		First Last													
1 of 1		Records		Next Back		OLPRR# 10972		Incident Data									
Lookup LUST		Log Number		26-08-0037		Site Type		UnRegulated									
Site Name		Ladd Inn Tavern				Received Date		1/11/2008									
Site Address		1204 SE Clay St				County		Multnomah									
Other						Facility Id		Lookup UST									
City		Portland		Zip Code		97214		Phone									
Responsible Party			Mail Contacts			Invoice Contact											
First Name			Diana			First Name			John								
Last Name			Blum			Last Name			O'Donovan								
Organization						Organization			City of Portland BES								
Address			6540 Chessington Ln			Address			1120 SW 5th Ave Room 1000								
Address2						Address2											
City			Gladstone			City			Portland								
State			OR		Zip Code		97027		State			OR		Zip Code		97204-1912	
Phone			503-000-0000			Phone			503-823-5861								
E-Mail						E-Mail											
Site Assessment			Discover Date			Discovery			Cause			Source			Confirmation		
			1/10/2008			Decommissioning			Unknown			Tank			Lab:RP		
Contaminants									Impacted Media								
☐ Heating Oil			☐ Leaded Gasoline			☒ Misc. Gasoline			☒ Diesel (Motor Fuel)			☐ Groundwater			☐ Free Product		
☐ Waste Oil			☐ Unleaded Gasoline			☐ Lubricant			☐ Solvent			☐ Surface Water			☐ Vapor		
☐ Other Pet. Dist.			☐ Chemical			☐ MTBE			☐ Unknown			☐ Drinking Water			☒ Soil		

Q-Time # 40338

Report for the
Department of Environmental Quality

UST Cleanup Activities for the City of Portland
at the Property of:
Rosemary Gray
located at:
1204 S. E. Clay Street, Portland, OR 97214

Prepared by:
Universal Applicators, Inc.

February 26, 2008

DEQ Log No. 26-08-0037



**Universal
Applicators, Inc.**

Report for the
Department of Environmental Quality

UST Cleanup Activities for the City of Portland
at the Property of:
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February 26, 2008

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Report for the Department of Environmental Quality
UST Cleanup Activity for the City of Portland at the Property of:

Rosemary Gray

Located at 1204 S. E. Clay Street, Portland, OR 97214

Prepared by: Universal Applicators, Inc.

DEQ Log No. 26-08-0037

February 26, 2008

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Report Narrative

Background

Universal Applicators, Inc./Cascade Environmental Services was retained by the City of Portland for the property owner Rosemary Gray et al to remove two abandoned underground petroleum storage tanks from the commercial property located at 1204 S. E. Clay Street, Portland, Oregon. Two gasoline tanks were located under city sidewalk adjacent to S. E. Hawthorne Blvd. on the North edge of the property. These tanks had not held product since prior to 1974, and thus were not subject to regulation.

On January 9, 2008, a crew from Universal Applicators, Inc. mobilized to the site to excavate the tanks. The tanks were inerted, exposed, cleaned and removed from the excavation. The tank contents were disposed of properly by Oil Rerefining Co., Inc. The tanks were transported to Metro Metals Northwest, Inc. for proper disposal.

After the tanks were removed, samples were taken from below the tank bottoms and analyzed using the NWTPH-HCID method of analysis. Both Gasoline and Diesel were detected under the South end of the East tank. Gasoline was detected under the South end of the West tank, and both Gasoline and Diesel (with Heavy Oil) were detected under the North end of the West tank. Upon quantification, the heaviest contamination of Gasoline occurred under the North end of the West tank at a level of 1,270 PPM of TPH. The heaviest contamination of Diesel occurred also under the North end of the West tank at a level of 509 PPM of TPH. The release was reported to DEQ and assigned file No. 26-08-0037.

On January 14, 2008, a crew from Universal Applicators, Inc. returned to the site to backfill the excavation. During backfilling operations, a third tank was discovered at the West perimeter of the excavation. City officials were consulted and it was agreed that this additional tank would also be removed. On January 23, 2008, the third tank was inerted, exposed, cleaned and removed from the excavation. The tank contents were disposed of properly by Oil Rerefining Co., Inc. The tank was transported to Metro Metals Northwest, Inc. for proper disposal.

After the tank was removed, samples were taken from below the tank bottom and analyzed using the NWTPH-HCID method of analysis. Both Gasoline and Diesel were detected under both ends of this tank (Tank 3). Upon quantification, the heaviest contamination of Gasoline occurred under the South end of Tank 3 at a level of 6,560 PPM of TPH. The heaviest contamination of Diesel occurred also under the South end of the Tank 3 at a level of 7,970 PPM of TPH.

Site Geology and Hydrogeology

The subject property is located in Multnomah County in the Township and Range of T1S R1E, Section 2. A search of this section and all adjacent sections indicated that there are no Water Supply Wells within ¼ mile of the site. A Geotechnical Hole located 100 meters Southwest of the site revealed a static water level of 20 feet below ground surface in depth. The log for this Well indicated sandy gravels as the soil type. Groundwater

flow direction is assumed to be toward the West, consistent with the site topography, and based on information contained in USGS Professional Paper 1424-B, "Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington", Woodward, Gannett, and Vaccaro, 1998.

Cleanup Activities

The property owners decided on a course of action at the site consisting of sampling the remaining plume and applying the appropriate analytical actions for the site.

Sampling Activities

On January 30, 2008, the contamination was sampled to determine the extent of contamination remaining and intensity of contamination remaining. Jesse Keyes, cleanup supervisor, supervised this activity at the City of Portland/Gray site. These samples were obtained using Geoprobe equipment and were placed into CAB liners, secured with vinyl end caps and transported to Apex Labs in Tigard, Oregon under proper chain of custody for analysis using the NWTPH-Gx and NWTPH-Dx methods of analysis. (See site map for sample locations). Sample Tank 3: S. End had been taken from the most contaminated soil remaining at the bottom of the excavation. It yielded results of 7,970 PPM of Diesel contamination and 6,560 PPM of Gasoline contamination. This sample was also analyzed for constituents. In order to determine the vertical extent of the contamination plume, sample B5-S-W-Tank-110" was geoprobed to a depth of 9 feet 2 inches B. G. S. from the South end of the West tank. It yielded results of Non Detect for TPH. Sample B6-W-110"-5' was geoprobed 5 feet West of the excavation to a depth of 9 feet 2 inches B. G. S. and yielded results of Non Detect for TPH. Sample B7-N-110"-5' was geoprobed 5 feet North of the excavation to a depth of 9 feet 2 inches B. G. S. and yielded results of Non Detect for TPH. Sample B8-E-110"-5' was geoprobed 5 feet East of the excavation to a depth of 9 feet 2 inches B. G. S. and yielded results of Non Detect for TPH. Sample B9-S-110"-5' was geoprobed 5 feet South of the excavation to a depth of 9 feet 2 inches B. G. S. and yielded results of Non Detect for TPH. At no time during excavation and sampling was groundwater encountered at the site.

These sample results establish a worst case horizontal diameter of 26 feet and a worst case vertical extent of 1 feet 2 inches. These dimensions yield a volume of contamination remaining of 16 cubic yards.

Pocket Closure

Where contaminated soil remains in excess of Soil Matrix Cleanup Levels appropriate for the site, DEQ allows closure of the site under a risk-based approach described in guidance published in 1999 and revised in 2003 and 2007, entitled **Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites (RBDM)**.

Risk-Based Conceptual Model

RBDM requires that contaminant pathways to reach human receptors are evaluated to determine applicable cleanup levels to protect human health and safety. Table 1 presents Universal Applicators, Inc's exposure pathway evaluation for the site.

Table 1: Exposure Pathways Considered

Potentially Exposed Population	Medium	Exposure Route and Exposure Point	Was This Pathway Selected?	Reason for Selection or Exclusion
Urban Resident	Soil	Ingestion, inhalation of particulates or vapors, and dermal absorption	No	Contamination is subsurface, under paving
Excavation Worker		"	No	"
Urban Resident		Volatilization to outdoor air	YES	Contamination will be adjacent to any future residential structure.
Occupational		"	YES	"
Urban Resident		Volatilization to indoor air	YES	Contamination will be adjacent to any future residential structure.
Occupational		"	YES	"
Urban Resident		Leaching to groundwater	No	No Water Supply Wells within ¼ mile radius of site.
Occupational		"	No	"
Urban Resident	Groundwater	Ingestion	No	There are no known groundwater impacts.
Occupational		"	No	"
Urban Resident		Volatilization to outdoor air	No	There are no known groundwater impacts.
Occupational		"	No	"
Urban Resident		Volatilization to indoor air	No	There are no known groundwater impacts.
Occupational		"	No	"
Urban Resident		Dermal absorption	No	There are no known groundwater impacts.
Occupational		"	No	"

Table 1 indicates that two exposure pathways are of concern with respect to human health and safety: volatilization to indoor air and volatilization to outdoor air. The conceptual site model is illustrated in the following figure, based on exposure pathways identified.

Figure 1: Site-Specific Conceptual Site Model

		Exposure Routes		Urban Residents	Occupational
Leaking UST	Soil	Volatilization	Indoor Air	X	X
		Volatilization	Outdoor Air	X	X

RBDM Site Specific Cleanup Levels

Because the conditions at this site differ significantly from the default conditions used by DEQ to calculate the generic RBCs in Appendix A, it was decided to use Site Specific RBCs for both TPH and constituents generated by agency supplied spreadsheets. These spreadsheets are included in this report as attachments. The Exposure Factor parameters changed to reflect the conditions encountered at this site included: Depth to groundwater; DAF; all soil contamination parameters with the exception of particulate emission factor for soils (PEF); and building height. These site parameters all differed significantly from default values. The altered parameters are highlighted in the attached worksheets. A comparison of contaminant concentrations in the pocket of contamination (represented by Sample Tank 3: S. End) with RBDM Site Specific Risk Based Concentrations is presented in Table 2.

Table 2. - Sample results and RBDM Site Specific RBCs

	Analytical results for Sample Tank 3: S. End	Site Specific RBC Soil - Vapor Intrusion into Buildings RBCsi		Site Specific RBC Soil - Vapor Intrusion Outdoors RBCso	
		Urban Residential	Occupational	Urban Residential	Occupational
Contaminant	(mg/kg)	(mg/kg)		(mg/kg)	
TPH - Gasoline	6560	>MAX	>MAX	>MAX	>MAX
TPH - Diesel	7970	>MAX	>MAX	>MAX	>MAX
Benzene	ND	-	-	240	640
Toluene	ND	-	-	-	-
Ethylbenzene	3.16	-	-	-	-
Xylenes	7.73	-	-	-	-
Naphthalene	12.2	-	-	-	-
Acenaphthene	ND	-	-	-	-
Anthracene	ND	-	-	-	-
Benz(a)anthracene	ND	-	-	-	-
Benzo(a)pyrene	ND	-	-	-	-
Benzo(b)fluoranthene	ND	-	-	-	-
Benzo(k)fluoranthene	ND	-	-	-	-
Chrysene	ND	-	-	-	-
Dibenz(a,h)anthracene	ND	-	-	-	-
Fluoranthene	2.64	-	-	-	-
Fluorene	ND	-	-	-	-
Indeno(1,2,3-cd)pyrene	ND	-	-	-	-
Pyrene	3.75	-	-	-	-
Iso-propylbenzene	4.53	-	-	-	-
n-propylbenzene	7.09	-	-	-	-
1,2,4-trimethylbenzene	38.9	-	-	-	-
1,3,5-trimethylbenzene	13.7	-	-	-	-
MTBE	ND	-	-	-	-
1,2-dibromoethane	ND	-	-	3.2	8.6
1,2-dichloroethane	ND	-	-	71	190
Total Recov. Lead	12.2	NA	NA	NA	NA

Table 2 shows that all contaminants are below RBDM RBCs for the pathways identified.

Site Completion

The sidewalk over the excavation will be replaced by City of Portland personnel.

Evaluation of Ecological Hazards

The pocket of PCS does not present a potential ecological hazard to sensitive environments at this time.

Conclusions

On January 9 and 23, 2008, the underground petroleum storage tanks at this site were decommissioned by removal.

Based on the Soil Matrix Cleanup investigation, a pocket of contamination with up to 6,560 PPM of TPH in the gasoline range and 7,970 PPM of TPH in the diesel range is present in the soils below the location of the old tanks. The pocket decreases to below matrix levels at 9 feet 2 inches below ground surface. The pocket is conservatively overestimated at 16 cubic yards.

Because the Soil Matrix Cleanup standard appropriate for the site was exceeded, sampling and analytical procedures were performed to assess potential risks to human health. A conceptual model of contaminant pathways and potential receptors was developed for the pocket of contamination. The pathways identified for further consideration during the assessment were inhalation of indoor vapors originating from contaminated soil, inhalation of outdoor vapors originating from contaminated soil, and leaching to groundwater.

No compounds exceeded RBDM Site Specific risk-based concentrations for the pathways specified.

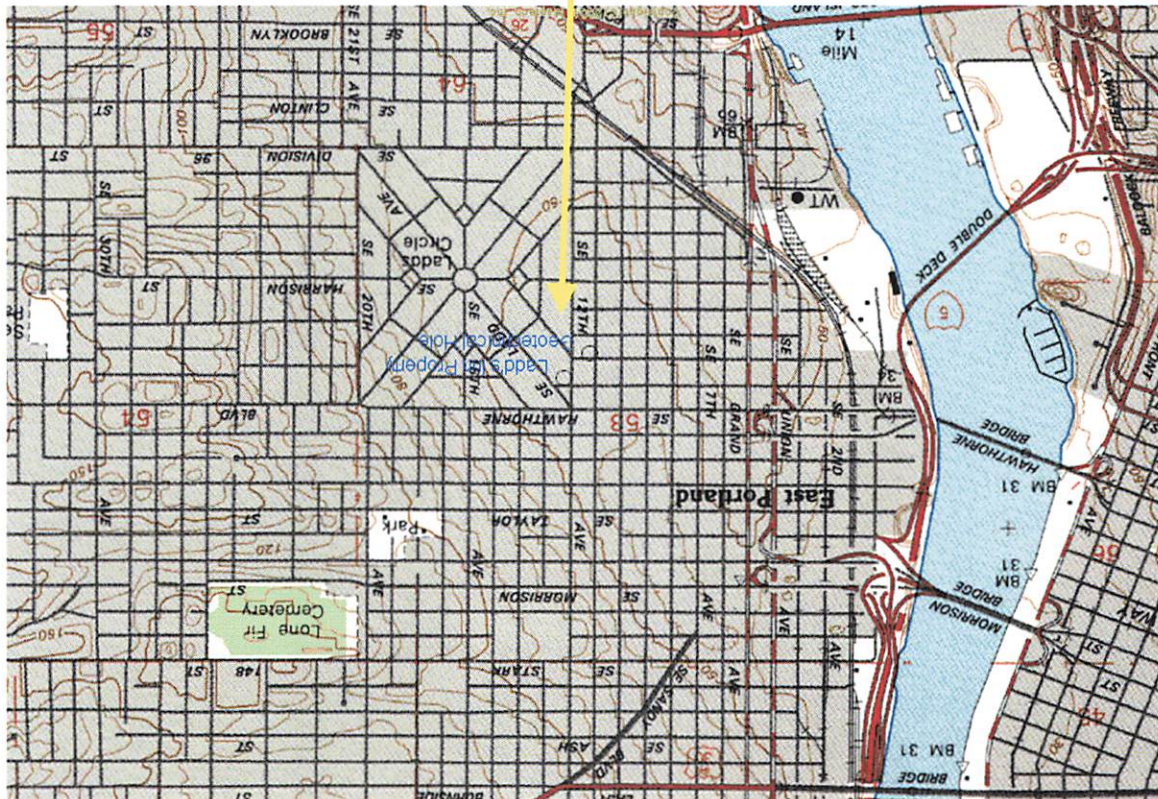
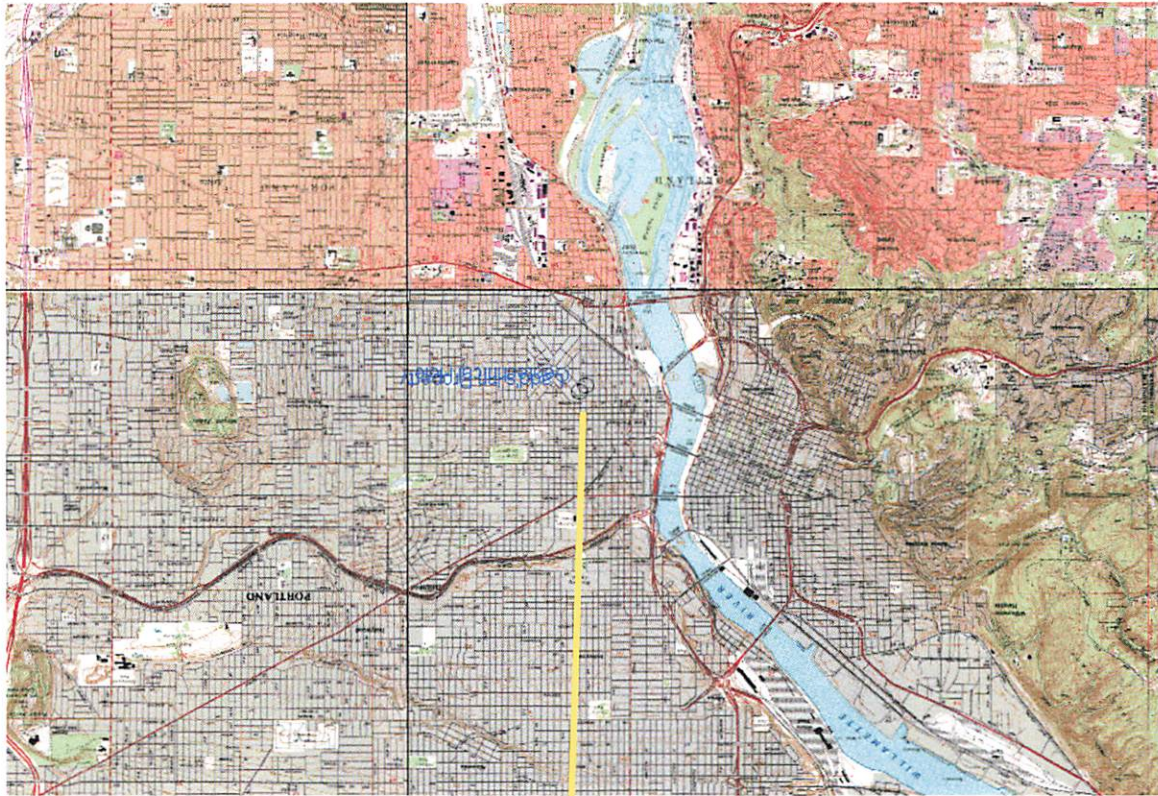
These findings and this report will be shared with the Office of Environmental Services of the City of Portland.

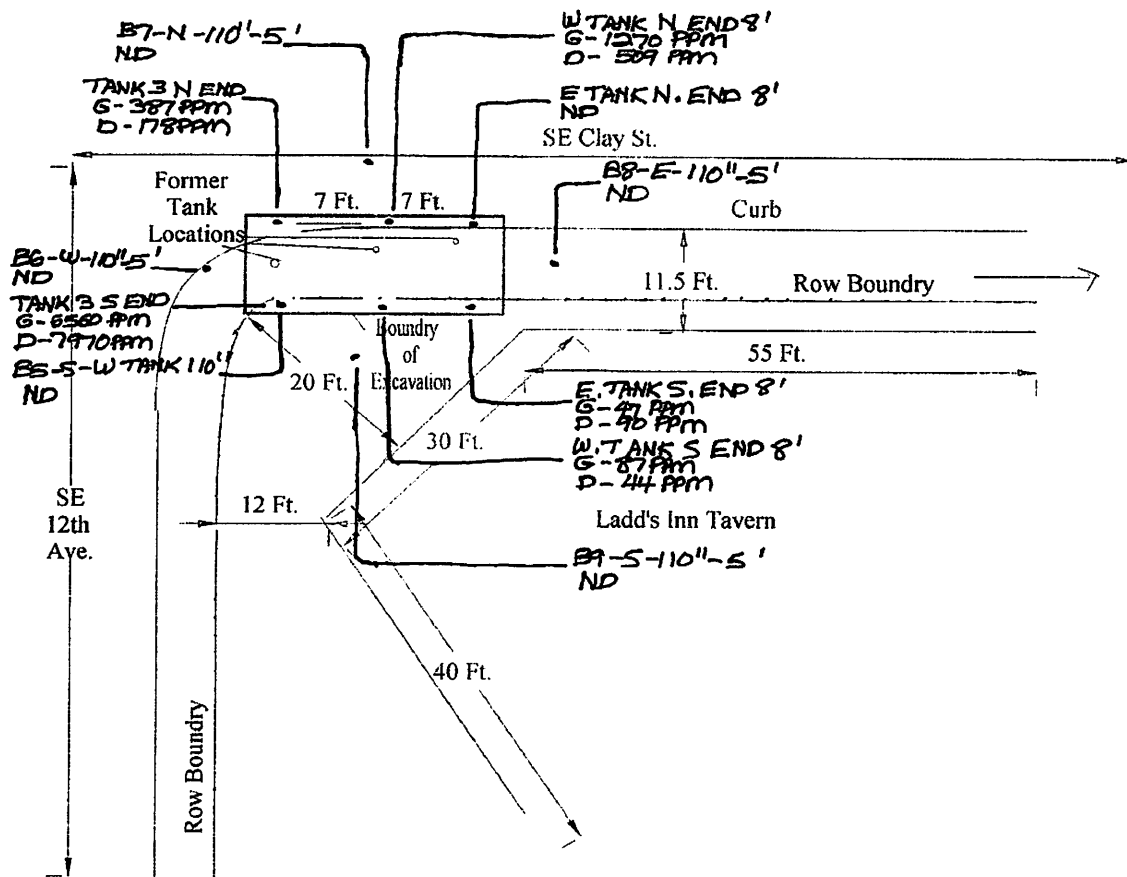
Recommendations

On the basis of the information provided above, Universal Applicators, Inc. has certified to the Oregon Department of Environmental Quality that no further action is warranted at the site and requested DEQ's concurrence with that conclusion.

Report Prepared by:

Robert A. Fisher
UST Supervisor







Job No. 08-013

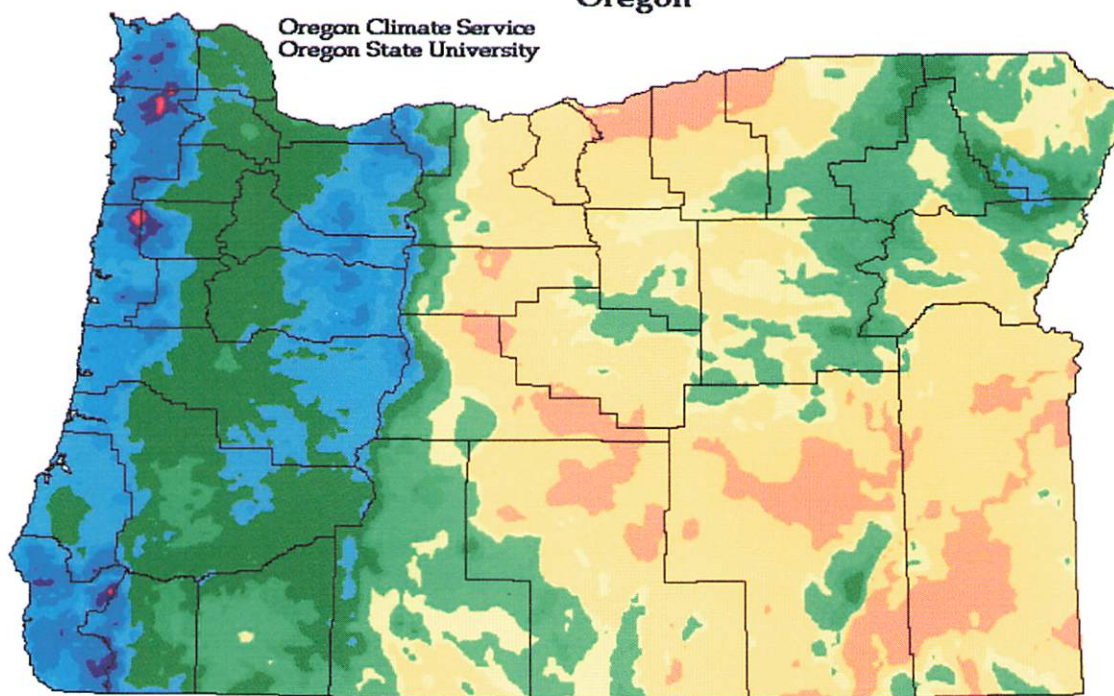
Scale 20 ft

Prepared by:
Universal Applicators, Inc.

Average Annual Precipitation

Oregon

Oregon Climate Service
Oregon State University



Period: 1961-1990

This map is a plot of 1961-1990 annual average precipitation contours from NOAA Cooperative stations and (where appropriate) USDA-NRCS SNOTEL stations. Christopher Daly used the PRISM model to generate the gridded estimates from which this map was derived; the modeled grid was approximately 4x4 km latitude/longitude, and was resampled to 2x2 km using a Gaussian filter. Mapping was performed by Jenny Weisberg and Nathaniel DeYoung. Funding was provided by USDA-NRCS National Water and Climate Center.

12/7/97

PORTLAND WSFO, OREGON (356751)

Period of Record Monthly Climate Summary

Period of Record : 11/1/1941 to 12/31/1998

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	44.8	50.4	55.3	60.8	67.4	73.0	79.7	79.7	74.8	63.7	52.4	46.1	62.4
Average Min. Temperature (F)	33.6	35.8	38.2	41.6	47.3	52.7	56.5	56.6	51.8	44.9	39.3	35.3	44.5
Average Total Precipitation (in.)	5.45	3.95	3.69	2.51	2.19	1.60	0.60	0.94	1.62	3.15	5.54	5.94	37.18
Average Total Snowfall (in.)	3.2	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4	6.6
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.

Max. Temp.: 92.7% Min. Temp.: 92.8% Precipitation: 92.8% Snowfall: 87.6% Snow Depth: 87.6%

Check [Station Metadata](#) or [Metadata graphics](#) for more detail about data completeness.

Western Regional Climate Center, wrc@dr.edu

SOIL MATRIX SCORE SHEET



Ladd Inn tanks West and East removed



Ladd Inn tank 3 removed



Ladd Inn backfilled excavation

STATE OF OREGON
GEOTECHNICAL HOLE REPORT
(as required by OAR 690-240-035)

(1) OWNER/PROJECT:

Name Chas. Jupp Hole Number B-2
Address 1633 SE 11th Ave
City Portland State OR Zip 97212

(2) TYPE OF WORK

☒ New ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) CONSTRUCTION:

☐ Rotary Air ☐ Hand Auger ☐ Hollow Stem Auger
☐ Rotary Mud ☐ Cable Tool ☒ Push Probe ☐ Other

(4) TYPE OF HOLE:

☒ Uncased Temporary ☐ Cased Permanent
☐ Uncased Permanent ☐ Slope Stability ☐ Other

(5) USE OF HOLE:

Soil & Water Sampling

(6) BORE HOLE CONSTRUCTION:

Special Construction approval ☐ Yes ☒ No Depth of Completed Hole 24 ft.

HOLE			SEAL			Sacks or pounds
Diameter	From	To	Material	From	To	
<u>2</u>	<u>0</u>	<u>21</u>	<u>Drill</u>	<u>0</u>	<u>21</u>	<u>200</u>

Backfill placed from _____ ft. to _____ ft. Material _____

Filter Pack placed from _____ ft. to _____ ft. Size of pack _____

(7) CASING/SCREEN:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Screen:					☐	☐	☐	☐
					☐	☐	☐	☐
Slot size								

(8) WELL TEST:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian
Permeability _____ Yield _____ GPM
Conductivity _____ PH _____
Temperature of water 51 °F Depth artesian flow found _____ ft.
Was water analysis done? ☒ Yes ☐ No
By whom? _____
Depth of strata analyzed. From _____ ft. to _____ ft.
Remarks: _____

(9) LOCATION OF HOLE by legal description:

County Mult Latitude _____ Longitude _____
Township _____ N or S Range _____ E or W W.M.
Section 2 Lot 14 Block 50 Subdivision _____
Tax Lot 1535 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) _____

Map with location identified must be attached

(10) STATIC WATER LEVEL:

20 ft. below land surface. Date 5/17/00
Artesian pressure _____ lb. per square inch. Date _____

(11) SUBSURFACE LOG:

Material Description	From	To	SWL
<u>Clay</u>	<u>0</u>	<u>4</u>	
<u>Sandy Clay</u>	<u>4</u>	<u>8</u>	
<u>Sandy Clay</u>	<u>8</u>	<u>24</u>	

Date Started 5/17/00 Date Completed 5/17/00

(12) ABANDONMENT LOG:

Material Description	From	To	Sacks or Pounds

RECEIVED

JUN 16 2000

Date started _____ Date Completed _____
WATER RESOURCES DEPT.
SALEM, OREGON

Professional Certification

(to be signed by a licensed water supply or monitoring well constructor, or Oregon registered geologist or civil engineer).

I accept responsibility for the construction, alteration, or abandonment work performed during the construction dates reported above. All work performed during this time is in compliance with Oregon's geotechnical hole construction standards. This report is true to the best of my knowledge and belief.

License or Registration Number 10357

Signed [Signature] Date 6/14/00

Affiliation Geo-Tec Exp.

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK

ORIGINAL - WATER RESOURCES DEPARTMENT FIRST COPY - CONSTRUCTOR SECOND COPY - CUSTOMER

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Thursday, January 31, 2008

Bob Fisher
Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

RE: City of Portland

Enclosed are the results of analyses for samples received by the laboratory on 1/30/2008 at 2:42:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com or by phone at 503-718-2323.

Apex Laboratories



Darwin Thomas, Sales/Marketing

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 1 of 11

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland
Project Manager Bob Fisher

Reported:
01/31/08 11:20

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B5-S-W-Tank-110"	A801262-01	Soil	01/30/08 08:30	01/30/08 14:42
B6-W-110"-5'	A801262-02	Soil	01/30/08 08:50	01/30/08 14:42
B7-N-110"-5'	A801262-03	Soil	01/30/08 09:15	01/30/08 14:42
B8-E-110"-5'	A801262-04	Soil	01/30/08 09:35	01/30/08 14:42
B9-S-110"-5'	A801262-05	Soil	01/30/08 10:00	01/30/08 14:42

Apex Laboratories



Darwin Thomas, Sales/Marketing

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Page 2 of 11

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc. 2357 SE 50th Ave. Portland, OR 97215	Project# City of Portland Project Manager: Bob Fisher	Reported: 01/31/08 11:20
--	--	-----------------------------

ANALYTICAL SAMPLE RESULTS

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx							
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method
B5-S-W-Tank-110" (A801262-01RE1)							
Matrix: Soil							
Diesel Range Organics	ND	---	36.5	mg/kg dry	1	01/30/08 18:55	NWTPH-Dx
Oil Range Organics	ND	---	72.9	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 67 %	Limits: 50-150 %	"	"	"
B6-W-110"-5' (A801262-02RE1)							
Matrix: Soil							
Diesel Range Organics	ND	---	34.4	mg/kg dry	1	01/30/08 19:14	NWTPH-Dx
Oil Range Organics	ND	---	68.8	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 91 %	Limits: 50-150 %	"	"	"
B7-N-110"-5' (A801262-03RE1)							
Matrix: Soil							
Diesel Range Organics	ND	---	31.7	mg/kg dry	1	01/30/08 19:33	NWTPH-Dx
Oil Range Organics	ND	---	63.4	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 84 %	Limits: 50-150 %	"	"	"
B8-E-110"-5' (A801262-04RE1)							
Matrix: Soil							
Diesel Range Organics	ND	---	34.0	mg/kg dry	1	01/30/08 20:11	NWTPH-Dx
Oil Range Organics	ND	---	68.0	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 85 %	Limits: 50-150 %	"	"	"
B9-S-110"-5' (A801262-05)							
Matrix: Soil							
Diesel Range Organics	ND	---	38.7	mg/kg dry	1	01/30/08 20:11	NWTPH-Dx
Oil Range Organics	ND	---	77.3	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 59 %	Limits: 50-150 %	"	"	"

Apex Laboratories



Darwin Thomas, Sales/Marketing

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Page 3 of 11

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland
Project Manager Bob Fisher

Reported:
01/31/08 11:20

ANALYTICAL SAMPLE RESULTS

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
B5-S-W-Tank-110" (A801262-01)								
Matrix: Soil								
Gasoline Range Organics	ND	---	5.42	mg/kg dry	50	01/30/08 18:53	NWTPH-Gx	
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 128 %	Limits: 50-150 %	1	-	-	
1,4-Difluorobenzene (Sur)			99 %	Limits: 50-150 %	-	-	-	
B6-W-110"-5" (A801262-02)								
Matrix: Soil								
Gasoline Range Organics	ND	---	4.93	mg/kg dry	50	01/30/08 19:22	NWTPH-Gx	
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 125 %	Limits: 50-150 %	1	-	-	
1,4-Difluorobenzene (Sur)			98 %	Limits: 50-150 %	-	-	-	
B7-N-110"-5" (A801262-03)								
Matrix: Soil								
Gasoline Range Organics	ND	---	5.20	mg/kg dry	50	01/30/08 19:52	NWTPH-Gx	
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 122 %	Limits: 50-150 %	1	-	-	
1,4-Difluorobenzene (Sur)			98 %	Limits: 50-150 %	-	-	-	
B8-E-110"-5" (A801262-04)								
Matrix: Soil								
Gasoline Range Organics	ND	---	5.32	mg/kg dry	50	01/30/08 20:22	NWTPH-Gx	
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 127 %	Limits: 50-150 %	1	-	-	
1,4-Difluorobenzene (Sur)			103 %	Limits: 50-150 %	-	-	-	
B9-S-110"-5" (A801262-05)								
Matrix: Soil								
Gasoline Range Organics	ND	---	5.22	mg/kg dry	50	01/30/08 20:52	NWTPH-Gx	
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 123 %	Limits: 50-150 %	1	-	-	
1,4-Difluorobenzene (Sur)			99 %	Limits: 50-150 %	-	-	-	

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Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager Bob Fisher	Reported: 01/31/08 11:20
---	---	-----------------------------

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight by D2216							
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method
B6-S-W-Tank-110" (A801262-01) Matrix: Soil							
% Solids	72.0	---	1.00	% by Weight	1	01/31/08 07:32	D2216
B6-W-110"-5' (A801262-02) Matrix: Soil							
% Solids	74.7	---	1.00	% by Weight	1	01/31/08 07:32	D2216
B7-N-110"-5' (A801262-03) Matrix: Soil							
% Solids	73.5	---	1.00	% by Weight	1	01/31/08 07:32	D2216
B8-E-110"-5' (A801262-04) Matrix: Soil							
% Solids	74.3	---	1.00	% by Weight	1	01/31/08 07:32	D2216
B9-S-110"-5' (A801262-05) Matrix: Soil							
% Solids	73.2	---	1.00	% by Weight	1	01/31/08 07:32	D2216

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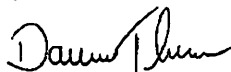
Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager, Bob Fisher	Reported: 01/31/08 11:20
---	--	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010259 - EPA 3546 (Fuels)						Soil						
Blank (8010259-BL.K1)						Analyzed: 01/30/08 15:31						
Diesel Range Organics	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	
Oil Range Organics	ND	---	40.0	"	"	---	---	---	---	---	---	
<i>Surr: o-Terphenyl (Surr)</i>						<i>Recovery: 111% Limits: 50-150% Dilution: 1x</i>						
I.C.S. (8010259-BS1)						Analyzed: 01/30/08 15:12						
Diesel Range Organics	89.5	---	20.0	mg/kg wet	1	83.3	---	107	75-125%	---	---	
Oil Range Organics	92.5	---	40.0	"	"	83.3	---	111	75-125%	---	---	
<i>Surr: o-Terphenyl (Surr)</i>						<i>Recovery: 111% Limits: 50-150% Dilution: 1x</i>						
Duplicate (8010259-DU.P3)						Source: AN01262-03RE1 Analyzed: 01/30/08 19:52						
Diesel Range Organics	ND	---	35.6	mg/kg dry	1	---	ND	---	---	---	40%	
Oil Range Organics	ND	---	71.1	"	"	---	ND	---	---	---	40%	
<i>Surr: o-Terphenyl (Surr)</i>						<i>Recovery: 88% Limits: 50-150% Dilution: 1x</i>						

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---	--	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range (C8-C10) Hydrocarbons by NWTPH-Gx											
Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 8010256 - EPA 5035-Mod (w/o Field Pres.)						Soil					
Blank (8010256-BLK1)						Analyzed: 01/30/08 12:56					
Gasoline Range Organics	ND	---	4.00	mg/kg wet	50	---	---	---	---	---	---
Surr: 4-Bromofluorobenzene (Sur)			Recovery: 124%	Limits: 50-150%		Dilution: 1x					
1,4-Difluorobenzene (Sur)			9% %	50-150%		"					
LCS (8010256-BS2)						Analyzed: 01/30/08 12:26					
Gasoline Range Organics	23.8	---	4.00	mg/kg wet	50	25.0	---	95	70-130%	---	---
Surr: 4-Bromofluorobenzene (Sur)			Recovery: 110%	Limits: 50-150%		Dilution: 1x					
1,4-Difluorobenzene (Sur)			100%	50-150%		"					

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--	--	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight by D2216											
Analyte	Result	MDI	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%RFC Limits	RPD Limit	Notes
Batch 8010260 - Dry Weight						Soil					
Duplicate (8010260-D1 P2)			Source: A801262-04			Analyzed: 01/31/08 07:32					
% Solids	74.1	---	100	% by Weight	1	---	74.3	---	---	0.3	20%

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---	---	-----------------------------

SAMPLE PREPARATION INFORMATION

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Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RI, Prep Factor
EPA 3546 (Fuels)							
Batch: 8010258							
A801262-01RE1	Soil	NWTPH-Dx	01/30/08 08:30	01/30/08 13:06	11.43g/5mL	15g/5mL	1.31
A801262-02RE1	Soil	NWTPH-Dx	01/30/08 08:50	01/30/08 13:06	11.68g/5mL	15g/5mL	1.28
A801262-03RE1	Soil	NWTPH-Dx	01/30/08 09:15	01/30/08 13:06	12.88g/5mL	15g/5mL	1.16
A801262-04RE1	Soil	NWTPH-Dx	01/30/08 09:35	01/30/08 13:06	11.87g/5mL	15g/5mL	1.26
A801262-05	Soil	NWTPH-Dx	01/30/08 10:00	01/30/08 13:06	10.6g/5mL	15g/5mL	1.42

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RI, Prep Factor
EPA 5035-Mod (w/o Field Pres.)							
Batch: 8010258							
A801262-01	Soil	NWTPH-Gx	01/30/08 08:30	01/30/08 16:20	10.254g/10mL	10g/10mL	0.98
A801262-02	Soil	NWTPH-Gx	01/30/08 08:50	01/30/08 16:20	10.867g/10mL	10g/10mL	0.92
A801262-03	Soil	NWTPH-Gx	01/30/08 09:15	01/30/08 16:20	10.473g/10mL	10g/10mL	0.96
A801262-04	Soil	NWTPH-Gx	01/30/08 09:35	01/30/08 16:20	10.115g/10mL	10g/10mL	0.99
A801262-05	Soil	NWTPH-Gx	01/30/08 10:00	01/30/08 16:20	10.473g/10mL	10g/10mL	0.96

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Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

Project#: City of Portland
Project Manager: Bob Fisher

Reported:
01/31/08 11:20

Notes and Definitions

Qualifiers:

Notes and Conventions:

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.

Batch Unless specifically stated, all analyses include full Batch QC, including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates, in order to meet or exceed method and regulatory requirements. This report contains only results for Batch QC derived from samples included in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.

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Universal Applicators, Inc.	Project#: City of Portland	
2357 SE 50th Ave		Reported:
Portland, OR 97215	Project Manager: Bob Fisher	01/31/08 11:20

[illegible]

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Darius Plummer

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Wednesday, February 27, 2008

Bob Fisher
Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

RE: City of Portland

Enclosed are the results of analyses for samples received by the laboratory on 1/23/2008 at 3:00:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

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Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager Bob Fisher	Reported: 02/27/08 15:43
---	---	-----------------------------

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION				
Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Tank3: N. End	A801207-01	Soil	01/23/08 13:00	01/23/08 15:00
Tank3: S. End	A801207-02	Soil	01/23/08 13:10	01/23/08 15:00

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Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

Project/ City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

HCID Screen by NWTPH-HCID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Tank3: N. End (A801207-01)			Matrix: Soil					
Gasoline Range Organics	DET	---	26.4	mg/kg dry	1	01/24/08 01:21	NWTPH-HCID	
Diesel Range Organics	DET	---	65.9	"	"	"	"	F-06
Oil Range Organics	ND	---	132	"	"	"	"	
Surrogate: o-Terphenyl (Surr)			Recovery: 117 % Limits: 50-150 %					
Tank3: S. End (A801207-02)			Matrix: Soil					
Gasoline Range Organics	DET	---	26.2	mg/kg dry	1	01/24/08 01:57	NWTPH-HCID	
Diesel Range Organics	DET	---	65.5	"	"	"	"	F-06
Oil Range Organics	DET	---	131	"	"	"	"	
Surrogate: o-Terphenyl (Surr)			Recovery: 71 % Limits: 50-150 %					

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Project/ City of Portland
Project Manager Bob Fisher

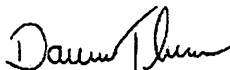
Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Tank3: N. End (A801207-01)			Matrix: Soil					
Diesel Range Organics	178	---	39.6	mg/kg dry	1	01/24/08 18:26	NWTPH-Dx	F-06
Oil Range Organics	ND	---	79.3	"	"	"	"	"
Surrogate: o-Terphenyl (Surv)			Recovery: 84 % Limits: 50-150 %					
Tank3: S. End (A801207-02)			Matrix: Soil					
Diesel Range Organics	4290	---	710	mg/kg dry	20	01/24/08 19:07	NWTPH-Dx	F-06
Oil Range Organics	3680	---	1420	"	"	"	"	"
Surrogate: o-Terphenyl (Surv)			Recovery: % Limits: 50-150 %					S-01

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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project: City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx							
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method
Tank3: N. End (A801207-01RE1)			Matrix: Soil				
Gasoline Range Organics	387	---	105	mg/kg dry	1000	01/25/08 23:38	NWTPH-Gx
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 117 %	Limits: 50-150 %	1	-	-
1,4-Difluorobenzene (Sur)			92 %	Limits: 50-150 %	-	-	-
Tank3: S. End (A801207-02RE1)			Matrix: Soil				
Gasoline Range Organics	6560	---	532	mg/kg dry	5000	01/26/08 00:37	NWTPH-Gx
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 129 %	Limits: 50-150 %	1	-	-
1,4-Difluorobenzene (Sur)			94 %	Limits: 50-150 %	-	-	-

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Portland, OR 97215

Project# City of Portland
Project Manager Bob Fisher

Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

RBCA Compounds (BTEX+) by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Tank3: S. End (A801207-02)		Matrix: Soil						
Methyl tert-butyl ether (MTBE)	ND	---	266	ug/kg dry	200	01/29/08 13:01	EPA 8260B	
1,2-Dibromoethane (EDB)	ND	---	133	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	---	133	"	"	"	"	
<i>Surrogate: Dibromofluoromethane (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 70-130 %</i>		"	"	
<i>1,4-Difluorobenzene (Surr)</i>		<i>115 %</i>		<i>Limits: 70-130 %</i>		"	"	
<i>Toluene-d8 (Surr)</i>		<i>89 %</i>		<i>Limits: 70-130 %</i>		"	"	
<i>4-Bromofluorobenzene (Surr)</i>		<i>152 %</i>		<i>Limits: 70-130 %</i>		"	"	S-04

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---	--	-----------------------------

ANALYTICAL SAMPLE RESULTS

BTEX Compounds by EPA 8260B							
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method
Tank3: S. End (A801207-02)		Matrix: Soil					
Benzene	ND	---	66.5	ug/kg dry	200	01/29/08 13:01	EPA 8260B
Toluene	ND	---	532	"	"	"	"
Ethylbenzene	3160	---	133	"	"	"	"
Xylenes, total	7730	---	399	"	"	"	"
Surrogate: Dibromofluoromethane (Surr)		Recovery: 103 %		Limits: 70-130 %		"	"
1,4-Difluorobenzene (Surr)		115 %		Limits: 70-130 %		"	"
Toluene-d8 (Surr)		89 %		Limits: 70-130 %		"	"
4-Bromofluorobenzene (Surr)		152 %		Limits: 70-130 %		"	"

S-04

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Portland, OR 97215

Project# City of Portland
Project Manager Bob Fisher

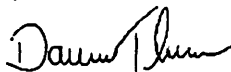
Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Tank3: S. End (A801207-02)			Matrix: Soil					
Acetone	ND	---	5320	ug/kg dry	200	01/29/08 13:01	EPA 8260B	
Benzene	ND	---	66.5	"	"	"	"	
Bromobenzene	ND	---	133	"	"	"	"	
Bromochloromethane	ND	---	133	"	"	"	"	
Bromodichloromethane	ND	---	133	"	"	"	"	
Bromoforn	ND	---	266	"	"	"	"	
Bromomethane	ND	---	2660	"	"	"	"	
2-Butanone (MEK)	ND	---	2660	"	"	"	"	
n-Butylbenzene	5430	---	133	"	"	"	"	
sec-Butylbenzene	4760	---	133	"	"	"	"	
tert-Butylbenzene	ND	---	532	"	"	"	"	
Carbon tetrachloride	ND	---	133	"	"	"	"	
Chlorobenzene	ND	---	133	"	"	"	"	
Chloroethane	ND	---	2660	"	"	"	"	
Chloroform	ND	---	1330	"	"	"	"	
Chloromethane	ND	---	1330	"	"	"	"	
2-Chlorotoluene	ND	---	133	"	"	"	"	
4-Chlorotoluene	ND	---	133	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	---	532	"	"	"	"	
Dibromochloromethane	ND	---	266	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	---	133	"	"	"	"	
Dibromomethane	ND	---	133	"	"	"	"	
1,2-Dichlorobenzene	ND	---	133	"	"	"	"	
1,3-Dichlorobenzene	ND	---	133	"	"	"	"	
1,4-Dichlorobenzene	ND	---	133	"	"	"	"	
Dichlorodifluoromethane	ND	---	266	"	"	"	"	
1,1-Dichloroethane	ND	---	133	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	---	133	"	"	"	"	
1,1-Dichloroethene	ND	---	133	"	"	"	"	
cis-1,2-Dichloroethene	ND	---	133	"	"	"	"	
trans-1,2-Dichloroethene	ND	---	133	"	"	"	"	
1,2-Dichloropropane	ND	---	133	"	"	"	"	
1,3-Dichloropropane	ND	---	133	"	"	"	"	
2,2-Dichloropropane	ND	---	266	"	"	"	"	

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Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project/ City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDI	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Tank3: S. End (A801207-02)		Matrix: Soil						
1,1-Dichloropropene	ND	---	133	ug/kg dry	200	-	EPA 8260B	
cis-1,3-Dichloropropene	ND	---	133	"	"	"	"	
trans-1,3-Dichloropropene	ND	---	266	"	"	"	"	
Ethylbenzene	3160	---	133	"	"	"	"	
Hexachlorobutadiene	ND	---	532	"	"	"	"	
2-Hexanone	ND	---	2660	"	"	"	"	
Isopropylbenzene	4530	---	133	"	"	"	"	
4-Isopropyltoluene	13300	---	133	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	---	2660	"	"	"	"	
Methyl tert-butyl ether (MTBE)	ND	---	266	"	"	"	"	
Methylene chloride	ND	---	1330	"	"	"	"	
Naphthalene	10400	---	1330	"	"	"	"	
n-Propylbenzene	7090	---	133	"	"	"	"	
Styrene	ND	---	133	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	---	266	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	---	133	"	"	"	"	
Tetrachloroethene (PCE)	ND	---	133	"	"	"	"	
Toluene	ND	---	532	"	"	"	"	
1,2,3-Trichlorobenzene	ND	---	532	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	532	"	"	"	"	
1,1,1-Trichloroethane	ND	---	266	"	"	"	"	
1,1,2-Trichloroethane	ND	---	133	"	"	"	"	
Trichloroethene (TCE)	ND	---	133	"	"	"	"	
Trichlorofluoromethane	ND	---	1330	"	"	"	"	
1,2,3-Trichloropropane	ND	---	133	"	"	"	"	
1,2,4-Trimethylbenzene	38900	---	266	"	"	"	"	
1,3,5-Trimethylbenzene	14700	---	266	"	"	"	"	
Vinyl chloride	ND	---	133	"	"	"	"	
m,p-Xylene	5020	---	266	"	"	"	"	
o-Xylene	2710	---	133	"	"	"	"	
Surrogate: Dibromofluoromethane (Surr)		Recovery	103 %	Limits:	70-130 %	"	"	
1,4-Difluorobenzene (Surr)			115 %	Limits:	70-130 %	"	"	
Toluene-d8 (Surr)			89 %	Limits:	70-130 %	"	"	
4-Bromofluorobenzene (Surr)			152 %	Limits:	70-130 %	"	"	S-04

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Universal Applicators, Inc.
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Portland, OR 97215

Project# City of Portland
Project Manager: Bob Fisher

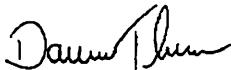
Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

PAH by EPA 8270C SIM

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Tank3: S. End (A801207-02)			Matrix: Soil					
Acenaphthene	ND	---	2200	ug/kg dry	50	01/30/08 13:36	EPA 8270C (SIM)	
Acenaphthylene	ND	---	2200	"	"	"	"	
Anthracene	ND	---	2200	"	"	"	"	
Benzo(a)anthracene	ND	---	2200	"	"	"	"	
Benzo(a)pyrene	ND	---	2200	"	"	"	"	
Benzo(b)fluoranthene	ND	---	2200	"	"	"	"	
Benzo(k)fluoranthene	ND	---	2200	"	"	"	"	
Benzo(g,h,i)perylene	ND	---	2200	"	"	"	"	
Chrysene	ND	---	2200	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	2200	"	"	"	"	
Fluoranthene	2640	---	2200	"	"	"	"	
Fluorene	ND	---	2200	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	2200	"	"	"	"	
Naphthalene	12200	---	2200	"	"	"	"	M-02
Phenanthrene	4500	---	2200	"	"	"	"	
Pyrene	3750	---	2200	"	"	"	"	
Surrogate: Nitrobenzene-d5 (Surr)			Recovery: 249 %	Limits: 35-120 %	"	"	"	S-05
2-Fluorobiphenyl (Surr)			70 %	Limits: 45-120 %	"	"	"	
p-Terphenyl-d14 (Surr)			93 %	Limits: 30-120 %	"	"	"	

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Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project/To: City of Portland Project Manager: Bob Fisher	Reported: 02/27/08 15:43
---	---	-----------------------------

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)							
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method
Tank3: S. End (A801207-02)			Matrix: Soil				
Lead	12.2	---	1.45	mg/kg dry	10	02/19/08 16:31	EPA 6020

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Universal Applicators, Inc.
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Portland, OR 97215

Project: City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight by D2216							
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method
Tank3: N. End (A801207-01)			Matrix: Soil				
% Solids	73.5	---	1.00	% by Weight	1	01/24/08 08:25	D2216
Tank3: S. End (A801207-02)			Matrix: Soil				
% Solids	73.4	---	1.00	% by Weight	1	01/24/08 08:25	D2216

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Portland, OR 97215

Project#: City of Portland
Project Manager: Bob Fisher

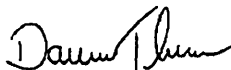
Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

HCID Screen by NWTPH-HCID

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010208 - NWTPH-HCID (Soil)						Soil						
Blank (8010208-BLK1)						Analyzed: 01/24/08 01:02						
NWTPH-HCID												
Gasoline Range Organics	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	
Diesel Range Organics	ND	---	50.0	"	"	---	---	---	---	---	---	
Oil Range Organics	ND	---	100	"	"	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)												
		Recovery: 143 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (8010208-DUP1)						Source: A801207-01 Analyzed: 01/24/08 01:39						
NWTPH-HCID												
Gasoline Range Organics	DET	---	26.8	mg/kg dry	1	---	61.3	---	---	93	25%	Q-04
Diesel Range Organics	DET	---	66.9	"	"	---	122	---	---	91	25%	F-06, Q-04
Oil Range Organics	ND	---	134	"	"	---	ND	---	---	---	25%	
Surr: o-Terphenyl (Surr)												
		Recovery: 99 %		Limits: 50-150 %		Dilution: 1x						

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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland
Project Manager Bob Fisher

Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010215 - EPA 3646 (Fuels)						Soil						
Blank (8010215-BLK1)						Analyzed: 01/24/08 17:24						
NWTPH-Dx												
Diesel Range Organics	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	
Oil Range Organics	ND	---	40.0	"	"	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)												
			Recovery: 113 %	Limits: 50-150 %	Dilution: 1x							
LCS (8010215-BS1)						Analyzed: 01/24/08 17:03						
NWTPH-Dx												
Diesel Range Organics	82.3	---	20.0	mg/kg wet	1	83.3	---	99	75-125%	---	---	
Oil Range Organics	95.6	---	40.0	"	"	---	---	115	"	---	---	
Surr: o-Terphenyl (Surr)												
			Recovery: 109 %	Limits: 50-150 %	Dilution: 1x							
Duplicate (8010215-D1 P2)						Source: A801207-01 Analyzed: 01/24/08 18:47						
NWTPH-Dx												
Diesel Range Organics	406	---	34.4	mg/kg dry	1	---	178	---	---	78	40%	F-06, Q-04
Oil Range Organics	ND	---	68.8	"	"	---	ND	---	---	---	40%	
Surr: o-Terphenyl (Surr)												
			Recovery: 93 %	Limits: 50-150 %	Dilution: 1x							

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Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager Bob Fisher	Reported: 02/27/08 15:43
---	---	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range (C8-C10) Hydrocarbons by NWTPH-Gx

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010218 - EPA 5035-Mod (w/o Field Pres.)						Soil						
Blank (8010218-BLK1)						Analyzed: 01/24/08 14:14						
NWTPH-Gx												
Gasoline Range Organics	ND	---	4.00	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Surr)			Recovery: 108%	Limits: 50-150%		Dilution: 1x						
1,4-Difluorobenzene (Surr)			88%	50-150%								
LCS (8010218-BS2)						Analyzed: 01/24/08 13:43						
NWTPH-Gx												
Gasoline Range Organics	28.8	---	4.00	mg/kg wet	50	25.0	---	115	70-130%	---	---	
Surr: 4-Bromofluorobenzene (Surr)			Recovery: 113%	Limits: 50-150%		Dilution: 1x						
1,4-Difluorobenzene (Surr)			84%	50-150%								

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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx

Analyte	Result	MDI	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010223 - EPA 5035-Mod (w/o Field Pres.)						Soil						
Blank (8010223-BLK1)						Analyzed: 01/25/08 17:41						
NWTPH-Gx												
Gasoline Range Organics	ND	---	4.00	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)			Recovery: 111 %	Limit: 50-150 %			Dilution: 1x					
1,4-Difluorobenzene (Sur)			93 %	50-150 %			"					
LCS (8010223-BIS2)						Analyzed: 01/25/08 17:11						
NWTPH-Gx												
Gasoline Range Organics	24.3	---	4.00	mg/kg wet	50	25.0	---	97	70-130%	---	---	
Surr: 4-Bromofluorobenzene (Sur)			Recovery: 112 %	Limit: 50-150 %			Dilution: 1x					
1,4-Difluorobenzene (Sur)			92 %	50-150 %			"					

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Universal Applicators, Inc.
2357 St. 50th Ave
Portland, OR 97215

Project: City of Portland
Project Manager: Bob Fisher

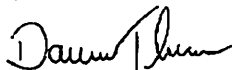
Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

RBGA Compounds (BTEX+) by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010245 - EPA 5035-Mod (w/o Field Pres.)												
Blank (8010245-BL.K1)												
EPA 8260B												
Methyl tert-butyl ether (MTBE)	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	25.0	"	"	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	25.0	"	"	---	---	---	---	---	---	
Surr: Dibromofluoromethane (Surr)												
Recovery: 106 % Limits: 70-130 % Dilution: 1x												
1,4-Difluorobenzene (Surr)												
115 % 70-130 %												
Toluene-d8 (Surr)												
92 % 70-130 %												
4-Bromofluorobenzene (Surr)												
104 % 70-130 %												
LCS (8010245-BL1)												
EPA 8260B												
Methyl tert-butyl ether (MTBE)	1100	---	50.0	ug/kg wet	50	1000	---	110	65-135%	---	---	
1,2-Dibromoethane (EDB)	1050	---	25.0	"	"	"	---	105	"	---	---	
1,2-Dichloroethane (EDC)	1200	---	25.0	"	"	"	---	120	"	---	---	
Surr: Dibromofluoromethane (Surr)												
Recovery: 107 % Limits: 70-130 % Dilution: 1x												
1,4-Difluorobenzene (Surr)												
115 % 70-130 %												
Toluene-d8 (Surr)												
95 % 70-130 %												
4-Bromofluorobenzene (Surr)												
105 % 70-130 %												
Matrix Spike (8010245-MS1)												
Source: A801207-02												
EPA 8260B												
Methyl tert-butyl ether (MTBE)	5840	---	266	ug/kg dry	200	5320	ND	110	65-135%	---	---	
1,2-Dibromoethane (EDB)	5550	---	133	"	"	"	ND	104	"	---	---	
1,2-Dichloroethane (EDC)	6220	---	133	"	"	"	60.5	116	"	---	---	
Surr: Dibromofluoromethane (Surr)												
Recovery: 104 % Limits: 70-130 % Dilution: 1x												
1,4-Difluorobenzene (Surr)												
113 % 70-130 %												
Toluene-d8 (Surr)												
84 % 70-130 %												
4-Bromofluorobenzene (Surr)												
161 % 70-130 %												

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2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%R/C Limits	RPD	Notes
Batch 8010245 - EPA 6035-Mod (w/o Field Pres.)						Soil					
Blank (8010245-BLK1)						Analyzed: 01/29/08 12:31					
EPA 8260B											
Benzene	ND	---	12.5	ug/kg wet	50	---	---	---	---	---	---
Toluene	ND	---	100	"	"	---	---	---	---	---	---
Ethylbenzene	ND	---	25.0	"	"	---	---	---	---	---	---
Xylenes, total	ND	---	75.0	"	"	---	---	---	---	---	---
Surr: Dibromofluoromethane (Surr) Recovery: 106 % Limits: 70-130 % Dilution: 1x											
1,4-Difluorobenzene (Surr) 115 % 70-130 % "											
Toluene-d8 (Surr) 92 % 70-130 % "											
4-Bromofluorobenzene (Surr) 104 % 70-130 % "											
ICS (8010245-BS1)						Analyzed: 01/29/08 11:31					
EPA 8260B											
Benzene	1170	---	12.5	ug/kg wet	50	1000	---	117	65-135%	---	---
Toluene	963	---	100	"	"	"	---	96	"	---	---
Ethylbenzene	1050	---	25.0	"	"	"	---	105	"	---	---
Xylenes, total	3230	---	75.0	"	"	3000	---	108	"	---	---
Surr: Dibromofluoromethane (Surr) Recovery: 107 % Limits: 70-130 % Dilution: 1x											
1,4-Difluorobenzene (Surr) 115 % 70-130 % "											
Toluene-d8 (Surr) 95 % 70-130 % "											
4-Bromofluorobenzene (Surr) 105 % 70-130 % "											
Matrix Spike (8010245-MS1)						Source: A801207-02		Analyzed: 01/29/08 13:30			
EPA 8260B											
Benzene	6220	---	66.5	ug/kg dry	200	5320	ND	117	65-135%	---	---
Toluene	5070	---	532	"	"	"	282	90	"	---	---
Ethylbenzene	8850	---	133	"	"	"	3160	107	"	---	---
Xylenes, total	24100	---	399	"	"	15900	7730	103	"	---	---
Surr: Dibromofluoromethane (Surr) Recovery: 104 % Limits: 70-130 % Dilution: 1x											
1,4-Difluorobenzene (Surr) 113 % 70-130 % "											
Toluene-d8 (Surr) 84 % 70-130 % "											
4-Bromofluorobenzene (Surr) 161 % 70-130 % "											

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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project/Client: City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%R/C Limits	RPD	RPD Limit	Notes
Batch 8010245 - EPA 5035-Mod (w/o Field Pres.)						Soil						
Blank (8010245-BLK1)						Analyzed: 01/29/08 12:31						
EPA 8260B												
Acetone	ND	---	1000	ug/kg wet	50	---	---	---	---	---	---	
Benzene	ND	---	12.5	"	"	---	---	---	---	---	---	
Bromobenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
Bromochloromethane	ND	---	25.0	"	"	---	---	---	---	---	---	
Bromodichloromethane	ND	---	25.0	"	"	---	---	---	---	---	---	
Bromoform	ND	---	50.0	"	"	---	---	---	---	---	---	
Bromomethane	ND	---	500	"	"	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	500	"	"	---	---	---	---	---	---	
n-Butylbenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	25.0	"	"	---	---	---	---	---	---	
Chlorobenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
Chloroethane	ND	---	500	"	"	---	---	---	---	---	---	
Chloroform	ND	---	250	"	"	---	---	---	---	---	---	
Chloromethane	ND	---	250	"	"	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	25.0	"	"	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	25.0	"	"	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	100	"	"	---	---	---	---	---	---	
Dibromochloromethane	ND	---	50.0	"	"	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	25.0	"	"	---	---	---	---	---	---	
Dibromomethane	ND	---	25.0	"	"	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	50.0	"	"	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	25.0	"	"	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	25.0	"	"	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	25.0	"	"	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	25.0	"	"	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	25.0	"	"	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	25.0	"	"	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	25.0	"	"	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	50.0	"	"	---	---	---	---	---	---	

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project#: City of Portland
Project Manager: Bob Fisher

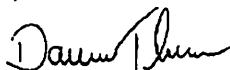
Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010245 - EPA 5035-Mod (w/o Field Pres.)						Soil						
Blank (8010245-BLK1)						Analyzed: 01/29/08 12:31						
1,1-Dichloropropene	ND	---	25.0	ug/kg wet	"	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	25.0	"	"	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	50.0	"	"	---	---	---	---	---	---	
Ethylbenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	100	"	"	---	---	---	---	---	---	
2-Hexanone	ND	---	500	"	"	---	---	---	---	---	---	
Isopropylbenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	25.0	"	"	---	---	---	---	---	---	
4-Methyl-2-pentanone (MIBK)	ND	---	500	"	"	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	50.0	"	"	---	---	---	---	---	---	
Methylene chloride	ND	---	250	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	250	"	"	---	---	---	---	---	---	
n-Propylbenzene	ND	---	25.0	"	"	---	---	---	---	---	---	
Styrene	ND	---	25.0	"	"	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	50.0	"	"	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	25.0	"	"	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	25.0	"	"	---	---	---	---	---	---	
Toluene	ND	---	100	"	"	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	100	"	"	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	100	"	"	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	50.0	"	"	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	25.0	"	"	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	25.0	"	"	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	250	"	"	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	25.0	"	"	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	50.0	"	"	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	50.0	"	"	---	---	---	---	---	---	
Vinyl chloride	ND	---	25.0	"	"	---	---	---	---	---	---	
m,p-Xylene	ND	---	50.0	"	"	---	---	---	---	---	---	
o-Xylene	ND	---	25.0	"	"	---	---	---	---	---	---	
Surr: Dibromofluoromethane (Surr)	Recovery:		106 %	Limits:		70-130 %	Dilution:		1x			
1,4-Difluorobenzene (Surr)			115 %			70-130 %			"			
Toluene-d8 (Surr)			92 %			70-130 %			"			
4-Bromofluorobenzene (Surr)			104 %			70-130 %			"			

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Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager: Bob Fisher	Reported: 02/27/08 15:43
---	--	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%RFC Limits	RPD	RPD Limit	Notes
Batch 8010245 - EPA 6035-Mod (w/o Field Pres.)						Soil						
LCS (8010245-B51)						Analyzed: 01/29/08 11:31						
EPA 8260B												
Acetone	1680	---	1000	ug/kg wet	50	2000	---	84	65-135%	---	---	
Benzene	1170	---	12.5	"	"	1000	---	117	"	---	---	
Bromobenzene	1030	---	25.0	"	"	"	---	103	"	---	---	
Bromochloromethane	1120	---	25.0	"	"	"	---	112	"	---	---	
Bromodichloromethane	1080	---	25.0	"	"	"	---	108	"	---	---	
Bromoform	924	---	50.0	"	"	"	---	92	"	---	---	
Bromomethane	814	---	500	"	"	"	---	81	"	---	---	
2-Butanone (MEK)	2180	---	500	"	"	2000	---	109	"	---	---	
n-Butylbenzene	858	---	25.0	"	"	1000	---	86	"	---	---	
sec-Butylbenzene	1090	---	25.0	"	"	"	---	109	"	---	---	
tert-Butylbenzene	1020	---	25.0	"	"	"	---	102	"	---	---	
Carbon tetrachloride	1000	---	25.0	"	"	"	---	100	"	---	---	
Chlorobenzene	1000	---	25.0	"	"	"	---	100	"	---	---	
Chloroethane	858	---	500	"	"	"	---	86	"	---	---	
Chloroform	1160	---	250	"	"	"	---	116	"	---	---	
Chloromethane	1270	---	250	"	"	"	---	127	"	---	---	
2-Chlorotoluene	1060	---	25.0	"	"	"	---	106	"	---	---	
4-Chlorotoluene	1120	---	25.0	"	"	"	---	112	"	---	---	
1,2-Dibromo-3-chloropropane	966	---	100	"	"	"	---	97	"	---	---	
Dibromochloromethane	967	---	50.0	"	"	"	---	97	"	---	---	
1,2-Dibromoethane (HDB)	1050	---	25.0	"	"	"	---	105	"	---	---	
Dibromomethane	1160	---	25.0	"	"	"	---	116	"	---	---	
1,2-Dichlorobenzene	1030	---	25.0	"	"	"	---	103	"	---	---	
1,3-Dichlorobenzene	1000	---	25.0	"	"	"	---	100	"	---	---	
1,4-Dichlorobenzene	958	---	25.0	"	"	"	---	96	"	---	---	
Dichlorodifluoromethane	1040	---	50.0	"	"	"	---	104	"	---	---	
1,1-Dichloroethane	1080	---	25.0	"	"	"	---	108	"	---	---	
1,2-Dichloroethane (EDC)	1200	---	25.0	"	"	"	---	120	"	---	---	
1,1-Dichloroethene	1080	---	25.0	"	"	"	---	108	"	---	---	
cis-1,2-Dichloroethene	1120	---	25.0	"	"	"	---	112	"	---	---	
trans-1,2-Dichloroethene	1100	---	25.0	"	"	"	---	110	"	---	---	
1,2-Dichloropropane	1330	---	25.0	"	"	"	---	133	"	---	---	
1,3-Dichloropropane	1080	---	25.0	"	"	"	---	108	"	---	---	
2,2-Dichloropropane	1080	---	50.0	"	"	"	---	108	"	---	---	

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Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project City of Portland
Project Manager Bob Fisher

Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010245 - EPA 5035-Mod (w/o Field Pres.)												
Soil												
LCS (8010245-B51)												
Analyzed: 01/29/08 11:31												
1,1-Dichloropropene	1210	---	25.0	ug/kg wet	-	-	---	121	"	---	---	
cis-1,3-Dichloropropene	1040	---	25.0	"	-	-	---	104	"	---	---	
trans-1,3-Dichloropropene	1030	---	50.0	"	-	-	---	103	"	---	---	
Ethylbenzene	1050	---	25.0	"	-	-	---	105	"	---	---	
Hexachlorobutadiene	819	---	100	"	-	-	---	82	"	---	---	
2-Hexanone	2160	---	500	"	-	2000	---	108	"	---	---	
Isopropylbenzene	980	---	25.0	"	-	1000	---	98	"	---	---	
4-Isopropyltoluene	1060	---	25.0	"	-	-	---	106	"	---	---	
4-Methyl-2-pentanone (MIBK)	2310	---	500	"	-	2000	---	116	"	---	---	
Methyl tert-butyl ether (MTBE)	1100	---	50.0	"	-	1000	---	110	"	---	---	
Methylene chloride	1050	---	25.0	"	-	-	---	105	"	---	---	
Naphthalene	1160	---	25.0	"	-	-	---	116	"	---	---	
n-Propylbenzene	1100	---	25.0	"	-	-	---	110	"	---	---	
Styrene	896	---	25.0	"	-	-	---	90	"	---	---	
1,1,1,2-Tetrachloroethane	971	---	50.0	"	-	-	---	97	"	---	---	
1,1,2,2-Tetrachloroethane	1020	---	25.0	"	-	-	---	102	"	---	---	
Tetrachloroethene (PCE)	912	---	25.0	"	-	-	---	91	"	---	---	
Toluene	963	---	100	"	-	-	---	96	"	---	---	
1,2,3-Trichlorobenzene	1030	---	100	"	-	-	---	103	"	---	---	
1,2,4-Trichlorobenzene	1000	---	100	"	-	-	---	100	"	---	---	
1,1,1-Trichloroethane	1020	---	50.0	"	-	-	---	102	"	---	---	
1,1,2-Trichloroethane	1060	---	25.0	"	-	-	---	106	"	---	---	
Trichloroethene (TCE)	1260	---	25.0	"	-	-	---	126	"	---	---	
Trichlorofluoromethane	628	---	25.0	"	-	-	---	63	"	---	---	Q-09
1,2,3-Trichloropropane	1050	---	25.0	"	-	-	---	105	"	---	---	
1,2,4-Trimethylbenzene	1070	---	50.0	"	-	-	---	107	"	---	---	
1,3,5-Trimethylbenzene	1060	---	50.0	"	-	-	---	106	"	---	---	
Vinyl chloride	1330	---	25.0	"	-	-	---	133	"	---	---	
m,p-Xylene	2220	---	50.0	"	-	2000	---	111	"	---	---	
o-Xylene	1010	---	25.0	"	-	1000	---	101	"	---	---	
Surr: Dibromofluoromethane (Surr)												
Recovery: 105 % Limits: 70-130 % Dilution: 1x												
1,4-Difluorobenzene (Surr)												
115 % 70-130 % "												
Toluene-d8 (Surr)												
95 % 70-130 % "												
4-Bromofluorobenzene (Surr)												
105 % 70-130 % "												

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project#: City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDI	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010245 - EPA 5035-Mod (w/o Field Pres.)						Soil						
Matrix Spike (8010245-MS1)			Source: A801207-02			Analyzed: 01/29/08 13:30						
EPA 8260B												
Acetone	8920	---	5320	ug/kg dry	200	10600	ND	84	65-135%	---	---	
Benzene	6220	---	66.5	"	"	5320	ND	117	"	---	---	
Bromobenzene	5250	---	133	"	"	"	ND	99	"	---	---	
Bromochloromethane	5690	---	133	"	"	"	ND	107	"	---	---	
Bromodichloromethane	8220	---	133	"	"	"	ND	155	"	---	---	Q-01
Bromoform	5040	---	266	"	"	"	ND	95	"	---	---	
Bromomethane	3860	---	2660	"	"	"	ND	73	"	---	---	
2-Butanone (MEK)	12060	---	2660	"	"	10600	205	111	"	---	---	
n-Butylbenzene	10900	---	133	"	"	5320	5430	103	"	---	---	
sec-Butylbenzene	10900	---	133	"	"	"	4760	116	"	---	---	
tert-Butylbenzene	6190	---	133	"	"	"	287	111	"	---	---	
Carbon tetrachloride	5280	---	133	"	"	"	ND	99	"	---	---	
Chlorobenzene	6040	---	133	"	"	"	ND	114	"	---	---	
Chloroethane	4270	---	2660	"	"	"	ND	80	"	---	---	
Chloroform	5990	---	1330	"	"	"	380	106	"	---	---	
Chloromethane	6910	---	1330	"	"	"	183	126	"	---	---	
2-Chlorotoluene	7830	---	133	"	"	"	ND	147	"	---	---	Q-01
4-Chlorotoluene	6830	---	133	"	"	"	ND	128	"	---	---	
1,2-Dibromo-3-chloropropane	5880	---	532	"	"	"	ND	111	"	---	---	
Dibromochloromethane	4970	---	266	"	"	"	ND	93	"	---	---	
1,2-Dibromoethane (EDB)	5550	---	133	"	"	"	ND	104	"	---	---	
Dibromomethane	6040	---	133	"	"	"	ND	114	"	---	---	
1,2-Dichlorobenzene	5350	---	133	"	"	"	ND	101	"	---	---	
1,3-Dichlorobenzene	5100	---	133	"	"	"	ND	96	"	---	---	
1,4-Dichlorobenzene	4860	---	133	"	"	"	ND	91	"	---	---	
Dichlorodifluoromethane	5560	---	266	"	"	"	ND	105	"	---	---	
1,1-Dichloroethane	5350	---	133	"	"	"	ND	101	"	---	---	
1,2-Dichloroethane (EDC)	6220	---	133	"	"	"	66.5	116	"	---	---	
1,1-Dichloroethene	5300	---	133	"	"	"	ND	100	"	---	---	
cis-1,2-Dichloroethene	5790	---	133	"	"	"	ND	109	"	---	---	
trans-1,2-Dichloroethene	5560	---	133	"	"	"	ND	104	"	---	---	
1,2-Dichloropropane	7620	---	133	"	"	"	ND	143	"	---	---	Q-01
1,3-Dichloropropane	5440	---	133	"	"	"	ND	102	"	---	---	
2,2-Dichloropropane	5390	---	266	"	"	"	ND	101	"	---	---	

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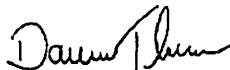
Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager: Bob Fisher	Reported: 02/27/08 15:43
---	--	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010245 - EPA 5035-Mod (w/o Field Pres.)												
Soil												
Matrix Spike (8010245-MIS1)			Source: A801207-02			Analyzed: 01/29/08 13:30						
1,1-Dichloropropene	6560	---	133	ug/kg dry	"	"	ND	123	"	---	---	
cis-1,3-Dichloropropene	5290	---	133	"	"	"	ND	100	"	---	---	
trans-1,3-Dichloropropene	5270	---	266	"	"	"	63.8	98	"	---	---	
Ethylbenzene	8850	---	133	"	"	"	3160	107	"	---	---	
Hexachlorobutadiene	6830	---	532	"	"	"	ND	128	"	---	---	
2-Hexanone	10700	---	2660	"	"	10600	274	98	"	---	---	
Isopropylbenzene	10000	---	133	"	"	5320	4530	103	"	---	---	
4-Isopropyltoluene	18700	---	133	"	"	"	13300	101	"	---	---	
4-Methyl-2-pentanone (MIBK)	13600	---	2660	"	"	10600	ND	128	"	---	---	
Methyl tert-butyl ether (MTBE)	5840	---	266	"	"	5320	ND	110	"	---	---	
Methylene chloride	5200	---	1330	"	"	"	359	91	"	---	---	
Naphthalene	15400	---	1330	"	"	"	10400	95	"	---	---	
n-Propylbenzene	13500	---	133	"	"	"	7690	121	"	---	---	
Styrene	4920	---	133	"	"	"	ND	93	"	---	---	
1,1,1,2-Tetrachloroethane	4840	---	266	"	"	"	ND	91	"	---	---	
1,1,2,2-Tetrachloroethane	7220	---	133	"	"	"	ND	136	"	---	---	Q-01
Tetrachloroethene (PCE)	4650	---	133	"	"	"	ND	87	"	---	---	
Toluene	5070	---	532	"	"	"	282	90	"	---	---	
1,2,3-Trichlorobenzene	5880	---	532	"	"	"	55.8	110	"	---	---	
1,2,4-Trichlorobenzene	6020	---	532	"	"	"	90.4	111	"	---	---	
1,1,1-Trichloroethane	5470	---	266	"	"	"	ND	103	"	---	---	
1,1,2-Trichloroethane	6440	---	133	"	"	"	ND	121	"	---	---	
Trichloroethene (TCE)	6640	---	133	"	"	"	ND	125	"	---	---	
Trichlorofluoromethane	3090	---	1330	"	"	"	173	55	"	---	---	Q-01
1,2,3-Trichloropropane	10700	---	133	"	"	"	ND	201	"	---	---	Q-01
1,2,4-Trimethylbenzene	43500	---	266	"	"	"	38900	87	"	---	---	
1,3,5-Trimethylbenzene	19900	---	266	"	"	"	14700	98	"	---	---	
Vinyl chloride	7260	---	133	"	"	"	ND	136	"	---	---	Q-01
m,p-Xylene	16000	---	266	"	"	10600	5020	103	"	---	---	
o-Xylene	8140	---	133	"	"	5320	2710	102	"	---	---	
Surr: Dibromofluoromethane (Surr) Recovery: 104 % Limits: 70-130 % Dilution: 1x												
1,4-Difluorobenzene (Surr) 113 % 70-130 % "												
Toluene-d8 (Surr) 84 % 70-130 % "												
4-Bromofluorobenzene (Surr) 161 % 70-130 % " S-04												

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503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland
Project Manager Bob Fisher

Reported:
02/27/08 15:43

QUALITY CONTROL (QC) SAMPLE RESULTS

PAH by EPA 8270C SIM

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010248 - EPA 3546												
Soil												
Blank (8010248-BL.K1)												
EPA 8270C (SIM)												
Analyzed: 01/30/08 12:54												
Acenaphthene	ND	---	25.0	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	25.0	"	"	---	---	---	---	---	---	
Anthracene	ND	---	25.0	"	"	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	25.0	"	"	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	25.0	"	"	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	25.0	"	"	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	25.0	"	"	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	25.0	"	"	---	---	---	---	---	---	
Chrysene	ND	---	25.0	"	"	---	---	---	---	---	---	
Dibenzo(a,h)anthracene	ND	---	25.0	"	"	---	---	---	---	---	---	
Fluoranthene	ND	---	25.0	"	"	---	---	---	---	---	---	
Fluorene	ND	---	25.0	"	"	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	25.0	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	25.0	"	"	---	---	---	---	---	---	
Phenanthrene	ND	---	25.0	"	"	---	---	---	---	---	---	
Pyrene	ND	---	25.0	"	"	---	---	---	---	---	---	
Surr: Nitrobenzene-d5 (Surr)												
Recovery: 95 %												
Limit: 35-120 %												
Dilution: 1x												
2-Fluorobiphenyl (Surr)												
102 %												
Limit: 45-120 %												
p-Terphenyl-d14 (Surr)												
112 %												
Limit: 30-120 %												
LCS (8010248-B51)												
EPA 8270C (SIM)												
Analyzed: 01/30/08 13:15												
Acenaphthene	200	---	25.0	ug/kg wet	1	167	---	120	45-120%	---	---	
Acenaphthylene	196	---	25.0	"	"	---	---	118	---	---	---	
Anthracene	208	---	25.0	"	"	---	---	125	55-120%	---	---	A-01
Benz(a)anthracene	197	---	25.0	"	"	---	---	118	50-120%	---	---	
Benzo(a)pyrene	209	---	25.0	"	"	---	---	125	---	---	---	A-01
Benzo(b)fluoranthene	191	---	25.0	"	"	---	---	115	45-120%	---	---	
Benzo(k)fluoranthene	204	---	25.0	"	"	---	---	123	45-125%	---	---	
Benzo(g,h,i)perylene	168	---	25.0	"	"	---	---	101	40-125%	---	---	
Chrysene	221	---	25.0	"	"	---	---	132	55-120%	---	---	A-01
Dibenzo(a,h)anthracene	170	---	25.0	"	"	---	---	102	40-125%	---	---	
Fluoranthene	215	---	25.0	"	"	---	---	129	55-120%	---	---	A-01
Fluorene	209	---	25.0	"	"	---	---	125	50-120%	---	---	A-01

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project/ City of Portland Project Manager Bob Fisher	Reported: 02/27/08 15:43
---	---	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

PAH by EPA 8270C SIM											
----------------------	--	--	--	--	--	--	--	--	--	--	--

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010248 - EPA 3546						Soil						
LCS (8010248-BS1)						Analyzed: 01/30/08 13:15						
Indeno(1,2,3-cd)pyrene	167	---	25.0	ug/kg wet	"	-	---	100	40-120%	---	---	
Naphthalene	180	---	25.0	"	"	-	---	108	"	---	---	
Phenanthrene	202	---	25.0	"	"	-	---	121	50-120%	---	---	A-01
Pyrene	208	---	25.0	"	"	-	---	125	45-125%	---	---	
Surr: Nurobenzene-d5 (Surr)		Recovery: 94 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		103 %		15-120 %		"						
p-Terphenyl-d14 (Surr)		110 %		30-120 %		"						

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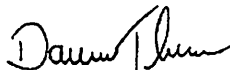
Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager: Bob Fisher	Reported: 02/27/08 15:43
---	--	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8020131 - EPA 3051						Soil						
Blank (8020131-BLK1)						Analyzed: 02/19/08 16:23						
EPA 6020												
Lead	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
LCS (8020131-BS1)						Analyzed: 02/19/08 16:25						
EPA 6020												
Lead	51.0	---	1.00	mg/kg wet	10	50.0	---	102	80-120%	---	---	

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Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

Project# City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

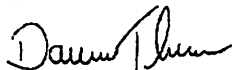
QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight by D2216

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010201 - Dry Weight						Soil						

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project#: City of Portland
Project Manager: Bob Fisher

Reported:
02/27/08 15:43

SAMPLE PREPARATION INFORMATION

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HCID Screen by NWTPH-HCID

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
NWTPH-HCID (Soil)							
Batch: 8010208							
A801207-01	Soil	NWTPH-HCID	01/23/08 13:00	01/23/08 15:53	10.32g/10mL	10g/10mL	0.97
A801207-02	Soil	NWTPH-HCID	01/23/08 13:10	01/23/08 15:53	10.4g/10mL	10g/10mL	0.96

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
EPA 3546 (Fuels)							
Batch: 8010215							
A801207-01	Soil	NWTPH-Dx	01/23/08 13:00	01/24/08 13:39	10.3g/5mL	15g/5mL	1.46
A801207-02	Soil	NWTPH-Dx	01/23/08 13:10	01/24/08 13:39	11.51g/5mL	15g/5mL	1.30

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
EPA 8035-Mod (w/o Field Pres.)							
Batch: 8010223							
A801207-01RE1	Soil	NWTPH-Gx	01/23/08 13:00	01/24/08 11:07	10.376g/10mL	10g/10mL	0.96
A801207-02RE1	Soil	NWTPH-Gx	01/23/08 13:10	01/24/08 11:07	10.251g/10mL	10g/10mL	0.98

RBCA Compounds (BTEX+) by EPA 8260B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
EPA 8035-Mod (w/o Field Pres.)							
Batch: 8010245							
A801207-02	Soil	EPA 8260B	01/23/08 13:10	01/24/08 11:07	10.251g/10mL	10g/10mL	0.98

BTEX Compounds by EPA 8260B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
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Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland Project Manager Bob Fisher	Reported: 02/27/08 15:43
---	---	-----------------------------

Apex Laboratories

BTEX Compounds by EPA 8260B

EPA 5035-Mod (w/o Field Pres.)

Batch: 8010245

A801207-02	Soil	EPA 8260B	01/23/08 13:10	01/24/08 11:07	10.251g/10mL	10g/10mL	0.98
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Volatile Organic Compounds by EPA 8260B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
------------	--------	--------	---------	----------	----------------------	-----------------------	----------------

EPA 5035-Mod (w/o Field Pres.)

Batch: 8010245

A801207-02	Soil	EPA 8260B	01/23/08 13:10	01/24/08 11:07	10.251g/10mL	10g/10mL	0.98
------------	------	-----------	----------------	----------------	--------------	----------	------

PAH by EPA 8270C SIM

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
------------	--------	--------	---------	----------	----------------------	-----------------------	----------------

EPA 3546

Batch: 8010248

A801207-02	Soil	EPA 8270C (SIM)	01/23/08 13:10	01/29/08 09:25	11.6g/5mL	15g/5mL	1.29
------------	------	-----------------	----------------	----------------	-----------	---------	------

Total Metals by EPA 6020 (ICPMS)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
------------	--------	--------	---------	----------	----------------------	-----------------------	----------------

EPA 3051

Batch: 8020131

A801207-02	Soil	EPA 6020	01/23/08 13:10	02/15/08 11:30	0.471g/50mL	0.5g/50mL	1.06
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Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

Project# City of Portland
Project Manager Bob Fisher

Reported:
02/27/08 15:43

Notes and Definitions

Qualifiers:

- A-01 Recovery of Lab Control Samples was above specified control limits. Data may be biased slightly high.
- F-06 Results in the diesel organics range are primarily due to overlap from a gasoline range product.
- M-02 Due to matrix interference, this analyte cannot be accurately quantified. The reported result is estimated.
- Q-01 The percent recovery and/or RPD was outside acceptance limits for this spiked sample. The batch was accepted based on LCS recovery.
- Q-04 The RPD and/or Percent Recovery for this QC sample is outside control limits due to a non-homogeneous sample matrix.
- Q-09 Acceptable Marginal Exceedance per NELAP Quality Systems Manual, App D, p5D-3.
- S-01 Surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interference.
- S-04 Surrogate recovery is outside of established control limits due to a sample matrix effect.
- S-05 Surrogate recovery cannot be accurately quantified due to sample dilution required from high analyte concentration and/or matrix interference.

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only
- Batch Unless specifically stated, all analyses include full Batch QC, including Sample Duplicates, Matrix Spikes and/or Matrix Spike
- QC Duplicates, in order to meet or exceed method and regulatory requirements. This report contains only results for Batch QC derived from samples included in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.

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**12232 S.W. Garden Place
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Universal Applicators, Inc.	Project#: City of Portland	
2357 SE 50th Ave		Reported:
Portland, OR 97215	Project Manager: Bob Fisher	02/27/08 15:43

[illegible]

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Darius Plummer

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Thursday, January 24, 2008

Bob Fisher
Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

RE: City of Portland / 08-013 UNI

Enclosed are the results of analyses for samples received by the laboratory on 1/9/2008 at 4:55:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

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503-718-2323 Phone
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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland / 08-013 U.N.
Project Manager Bob Fisher

Reported:
01/24/08 13:26

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
E. Tank S. End 8'	A801075-01	Soil	01/09/08 15:10	01/09/08 16:55
E. Tank N. End 8'	A801075-02	Soil	01/09/08 15:05	01/09/08 16:55
W. Tank S. End 4'	A801075-03	Soil	01/09/08 15:12	01/09/08 16:55
W. Tank S. End 8'	A801075-04	Soil	01/09/08 15:18	01/09/08 16:55
W. Tank N. End 8'	A801075-05	Soil	01/09/08 15:15	01/09/08 16:55

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Universal Applicators, Inc.
2357 SE 50th Ave.
Portland, OR 97215

Project#: City of Portland / 08-013 UN
Project Manager: Bob Fisher

Reported:
01/24/08 13:26

ANALYTICAL SAMPLE RESULTS

HCID Screen by NWTPH-HCID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
E. Tank S. End 8' (A801075-01RE1) Matrix: Soil								
Gasoline Range Organics	DET	---	27.4	mg/kg dry	1	01/10/08 14:49	NWTPH-HCID	
Diesel Range Organics	DET	---	68.6	"	"	"	"	F-06
Oil Range Organics	ND	---	137	"	"	"	"	
Surrogate: o-Terphenyl (Surr) Recovery: 113 % Limits: 50-150 %								
E. Tank N. End 8' (A801075-02) Matrix: Soil								
Gasoline Range Organics	ND	---	27.4	mg/kg dry	1	01/09/08 21:10	NWTPH-HCID	
Diesel Range Organics	ND	---	68.6	"	"	"	"	
Oil Range Organics	ND	---	137	"	"	"	"	
Surrogate: o-Terphenyl (Surr) Recovery: 187 % Limits: 50-150 %								
W. Tank S. End 4' (A801075-03) Matrix: Soil								
Gasoline Range Organics	ND	---	26.5	mg/kg dry	1	01/09/08 21:48	NWTPH-HCID	
Diesel Range Organics	ND	---	66.2	"	"	"	"	
Oil Range Organics	ND	---	132	"	"	"	"	
Surrogate: o-Terphenyl (Surr) Recovery: 185 % Limits: 50-150 %								
W. Tank S. End 8' (A801075-04RE1) Matrix: Soil								
Gasoline Range Organics	DET	---	24.6	mg/kg dry	1	01/10/08 14:29	NWTPH-HCID	
Diesel Range Organics	ND	---	61.6	"	"	"	"	
Oil Range Organics	ND	---	123	"	"	"	"	
Surrogate: o-Terphenyl (Surr) Recovery: 142 % Limits: 50-150 %								
W. Tank N. End 8' (A801075-05) Matrix: Soil								
Gasoline Range Organics	DET	---	27.6	mg/kg dry	1	01/09/08 22:26	NWTPH-HCID	
Diesel Range Organics	DET	---	68.9	"	"	"	"	F-06
Oil Range Organics	DET	---	138	"	"	"	"	
Surrogate: o-Terphenyl (Surr) Recovery: 132 % Limits: 50-150 %								

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Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland / 08-013 UN1 Project Manager: Bob Fisher	Reported: 01/24/08 13:26
---	---	-----------------------------

ANALYTICAL SAMPLE RESULTS

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
E. Tank S. End 8' (A801075-01)			Matrix: Soil					
Diesel Range Organics	90.1	---	32.7	mg/kg dry	1	01/11/08 19:22	NWTPH-Dx	F-06
Oil Range Organics	ND	---	65.4	"	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 58 % Limits: 50-150 %					
W. Tank S. End 8' (A801075-04)			Matrix: Soil					
Diesel Range Organics	43.5	---	31.2	mg/kg dry	1	01/11/08 19:41	NWTPH-Dx	F-06
Oil Range Organics	ND	---	62.4	"	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 63 % Limits: 50-150 %					
W. Tank N. End 8' (A801075-05)			Matrix: Soil					
Diesel Range Organics	265	---	33.6	mg/kg dry	1	01/11/08 20:00	NWTPH-Dx	F-06
Oil Range Organics	244	---	67.1	"	"	"	"	"
Surrogate: o-Terphenyl (Surr)			Recovery: 81 % Limits: 50-150 %					

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Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project # City of Portland / 08-013 UNI Project Manager Bob Fisher	Reported: 01/24/08 13:26
---	---	-----------------------------

ANALYTICAL SAMPLE RESULTS

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx							
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Notes
E. Tank S. End 8' (A801075-01) Matrix: Soil V-03							
Gasoline Range Organics	46.7	---	11.0	mg/kg dry	100	01/14/08 12:39	NWTPH-Gx
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 130 %	Limits: 50-150 %	1	"	"
1,4-Difluorobenzene (Sur)			98 %	Limits: 50-150 %	"	"	"
W. Tank S. End 8' (A801075-04) Matrix: Soil V-03							
Gasoline Range Organics	87.3	---	20.9	mg/kg dry	200	01/14/08 13:40	NWTPH-Gx
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 135 %	Limits: 50-150 %	1	"	"
1,4-Difluorobenzene (Sur)			98 %	Limits: 50-150 %	"	"	"
W. Tank N. End 8' (A801075-05) Matrix: Soil V-03							
Gasoline Range Organics	1270	---	54.1	mg/kg dry	500	01/14/08 14:11	NWTPH-Gx
Surrogate: 4-Bromofluorobenzene (Sur)			Recovery: 168 %	Limits: 50-150 %	1	"	S-02
1,4-Difluorobenzene (Sur)			98 %	Limits: 50-150 %	"	"	"

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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland / 08-013 UNI
Project Manager: Bob Fisher

Reported:
01/24/08 13:26

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight by D2216								
Analyte	Result	MIDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
E. Tank S. End 8' (A801075-01) Matrix: Soil								
% Solids	71.3	---	1.00	% by Weight	1	01/10/08 08:54	D2216	
E. Tank N. End 8' (A801075-02) Matrix: Soil								
% Solids	71.5	---	1.00	% by Weight	1	01/10/08 08:54	D2216	
W. Tank S. End 4' (A801075-03) Matrix: Soil								
% Solids	73.7	---	1.00	% by Weight	1	01/10/08 08:54	D2216	
W. Tank S. End 8' (A801075-04) Matrix: Soil								
% Solids	73.3	---	1.00	% by Weight	1	01/10/08 08:54	D2216	
W. Tank N. End 8' (A801075-05) Matrix: Soil								
% Solids	72.4	---	1.00	% by Weight	1	01/10/08 08:54	D2216	

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland / 08-013 UN Project Manager: Bob Fisher	Reported: 01/24/08 13:26
---	--	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

HCID Screen by NWTPH-HCID

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%R/C	Limits	RPD	RPD Limit	Notes	
Batch 8010080 - NWTPH-HCID (Soil)						Soil							
Blank (8010080-BLK1)						Analyzed: 01/09/08 20:33							
Gasoline Range Organics	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	---	
Diesel Range Organics	ND	---	50.0	"	"	---	---	---	---	---	---	---	
Oil Range Organics	ND	---	100	"	"	---	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)			Recovery: 135 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (8010080-DUP1)						Source: A801075-02		Analyzed: 01/09/08 21:29					
Gasoline Range Organics	ND	---	20.4	mg/kg dry	1	---	ND	---	---	---	25%	---	
Diesel Range Organics	ND	---	66.0	"	"	---	ND	---	---	---	25%	---	
Oil Range Organics	ND	---	132	"	"	---	ND	---	---	---	25%	---	
Surr: o-Terphenyl (Surr)			Recovery: 258 %		Limits: 50-150 %		Dilution: 1x						S.D.
Batch 8010085 - NWTPH-HCID (Soil)						Soil							
Blank (8010085-BLK1)						Analyzed: 01/10/08 14:29							
Gasoline Range Organics	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	---	
Diesel Range Organics	ND	---	50.0	"	"	---	---	---	---	---	---	---	
Oil Range Organics	ND	---	100	"	"	---	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)			Recovery: 97 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (8010085-DUP1)						Source: A801075-03RE1		Analyzed: 01/10/08 15:21					
Gasoline Range Organics	ND	---	26.0	mg/kg dry	1	---	ND	---	---	---	25%	---	
Diesel Range Organics	ND	---	65.0	"	"	---	ND	---	---	---	25%	---	
Oil Range Organics	ND	---	130	"	"	---	ND	---	---	---	25%	---	
Surr: o-Terphenyl (Surr)			Recovery: 110 %		Limits: 50-150 %		Dilution: 1x						

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland / 08-013 UNI
Project Manager Bob Fisher

Reported:
01/24/08 13:26

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%RFC Limits	RPD	RPD Limit	Notes
Batch 8010107 - EPA 3548 (Fuels)						Soil						
Blank (8010107-BL.K1)						Analyzed: 01/11/08 19:03						
Diesel Range Organics	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	
Oil Range Organics	ND	---	40.0	"	"	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 96 %		Limits: 50-150 %		Dilution: 1x						
I.CS (8010107-BS1)						Analyzed: 01/11/08 18:44						
Diesel Range Organics	82.5	---	20.0	mg/kg wet	1	83.3	---	99	75-125%	---	---	
Oil Range Organics	79.0	---	40.0	"	"	83.3	---	95	75-125%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 89 %		Limits: 50-150 %		Dilution: 1x						

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Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project: City of Portland / 08-013 UNI
Project Manager: Bob Fisher

Reported:
01/24/08 13:26

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010114 - EPA 5035-Mod (w/o Field Pres.)						Soil						
Blank (8010114-BL.K1)						Analyzed: 01/14/08 12:09						
Gasoline Range Organics	ND	---	4.00	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)			Recovery: 126 %	Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)			101 %	50-150 %		"						
LCS (8010114-BS2)						Analyzed: 01/14/08 11:38						
Gasoline Range Organics	23.7	---	4.00	mg/kg wet	50	25.0	---	95	70-130%	---	---	
Surr: 4-Bromofluorobenzene (Sur)			Recovery: 109 %	Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)			97 %	50-150 %		"						
Duplicate (8010114-DUP1)						Source: A801075-01						
Gasoline Range Organics	36.1	---	11.0	mg/kg dry	100	---	46.7	---	---	26	30%	V-03
Surr: 4-Bromofluorobenzene (Sur)			Recovery: 127 %	Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)			96 %	50-150 %		"						

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland / 08-013 UNI Project Manager: Bob Fisher	Reported: 01/24/08 13:26
---	---	-----------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight by D2216												
Analyte	Result	MID	Reporting Limit	Units	Dil	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8010076 - Dry Weight						Soil						
Duplicate (8010076-D1/P5)			Source: A801075-03			Analyzed: 01/10/08 08:54						
% Solids	73.0	---	1.00	% by Weight	1	---	73.7	---	---	1	20%	

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc. 2357 SE 50th Ave Portland, OR 97215	Project# City of Portland / 08-013 UNL Project Manager: Bob Fisher	Reported: 01/24/08 13:26
---	---	-----------------------------

SAMPLE PREPARATION INFORMATION

Apex Laboratories

HCID Screen by NWTPH-HCID

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RI, Prep Factor
NWTPH-HCID (Soil)							
Batch: 8010080							
A801075-02	Soil	NWTPH-HCID	01/09/08 15:05	01/09/08 17:50	10.21g/10mL	10g/10mL	0.98
A801075-03	Soil	NWTPH-HCID	01/09/08 15:12	01/09/08 17:50	10.25g/10mL	10g/10mL	0.98
A801075-05	Soil	NWTPH-HCID	01/09/08 15:15	01/09/08 17:50	10.02g/10mL	10g/10mL	1.00
Batch: 8010085							
A801075-01RE1	Soil	NWTPH-HCID	01/09/08 15:10	01/10/08 12:20	10.22g/10mL	10g/10mL	0.98
A801075-04RE1	Soil	NWTPH-HCID	01/09/08 15:18	01/10/08 12:20	11.08g/10mL	10g/10mL	0.90

Diesel Range (C10-C22) and Oil Range (C22-C40) Hydrocarbons by NWTPH-Dx

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RI, Prep Factor
EPA 3546 (Fuels)							
Batch: 8010107							
A801075-01	Soil	NWTPH-Dx	01/09/08 15:10	01/11/08 16:43	12.87g/5mL	15g/5mL	1.17
A801075-04	Soil	NWTPH-Dx	01/09/08 15:18	01/11/08 16:43	13.12g/5mL	15g/5mL	1.14
A801075-05	Soil	NWTPH-Dx	01/09/08 15:15	01/11/08 16:43	12.35g/5mL	15g/5mL	1.21

Gasoline Range (C6-C10) Hydrocarbons by NWTPH-Gx

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RI, Prep Factor
EPA 5035-Mod (w/o Field Pres.)							
Batch: 8010114							
A801075-01	Soil	NWTPH-Gx	01/09/08 15:10	01/14/08 09:38	10.178g/10mL	10g/10mL	0.98
A801075-04	Soil	NWTPH-Gx	01/09/08 15:18	01/14/08 09:38	10.43g/10mL	10g/10mL	0.96
A801075-05	Soil	NWTPH-Gx	01/09/08 15:15	01/14/08 09:38	10.214g/10mL	10g/10mL	0.98

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12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Universal Applicators, Inc.
2357 SE 50th Ave
Portland, OR 97215

Project# City of Portland / 08-013 U/N

Project Manager: Bob Fisher

Reported:
01/24/08 13:26

Notes and Definitions

Qualifiers:

- F-06 Results in the diesel organics range are primarily due to overlap from a gasoline range product
- S-02 Surrogate recovery cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract
- S-07 Surrogate recovery above control limits. Related target analytes were not detected, or detected below reporting limits, therefore data quality is not affected
- V-03 Sample aliquot taken from soil jar with headspace. Reported result is the minimum possible concentration and includes a low bias

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- Batch QC Unless specifically stated, all analyses include full Batch QC, including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates, in order to meet or exceed method and regulatory requirements. This report contains only results for Batch QC derived from samples included in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.

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Page 12 of 13

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Project#: City of Portland / 08-013 UN1

Reported:
01/24/08 13:26

Project Manager Bob Fisher

[illegible]

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Page 13 of 17

METRO METALS NORTHWEST, INC.
5611 N.E. Columbia Blvd.
Portland, Oregon 97218
(503) 287-8861

Wells Fargo Bank, N.A.

2052815
2052815

PAY TO THE ORDER OF Universal Applicators, Inc.

Jan. 10, 2008 \$ *97.68**

*****97 Dollars and 68 Cents DOLLARS**

Universal Applicators, Inc.
2357 SE 50th
Portland, OR 97215

TWO SIGNATURES REQUIRED OVER \$2,000 DOLLARS

AUTHORIZED SIGNATURE

AUTHORIZED SIGNATURE

⑈ 2052815⑈ ⑆ 121000248⑆ 4121218507⑈

METRO METALS NORTHWEST, INC.
5611 N.E. Columbia Blvd.
Portland, Oregon 97218
(503) 287-8861

Wells Fargo Bank, N.A.

2053731
2053731

PAY TO THE ORDER OF Universal Applicators, Inc.

Jan. 24, 2008 \$ *46.62**

*****46 Dollars and 62 Cents DOLLARS**

Universal Applicators, Inc.
2357 SE 50th
Portland, OR 97215

TWO SIGNATURES REQUIRED OVER \$2,000 DOLLARS

AUTHORIZED SIGNATURE

AUTHORIZED SIGNATURE

⑈ 2053731⑈ ⑆ 121000248⑆ 4121218507⑈

METRO METALS NORTHWEST, INC.: FERROUS

Vendor: 928 Universal Applicators, Inc.

Date: 01/24/2008

2053731

Paid To: Universal Applicators, Inc.

Weight: Jason Kimc

Ticket#: 741101 2053731

Total Wt: 840

Descr: 2053731

Tot.Paid: \$46.62

Notes:

Commodity	Gross	Tare	Tare2	Contam	Net	Price UM	Total
#2 Steel Unprepared	9,620	8,780			840	111.000 N	46.62

Headquarters
4150 N. Suttle Road
Portland, Oregon 97217
Phone 503-286-8352
Toll Free 800-367-8894
EPA# ORD980975692



Eugene, OR: EPA# ORQ000024941
Hoquiam, WA: EPA# WAD988519419
Klamath Falls, OR: EPA# ORD980980775
Kennewick, WA: EPA# WAH000011577
Medford, OR: EPA# ORD987197092
North Bend, OR: EPA# ORD980978266
Salt Lake City, UT: EPA# UTD982589459
Spokane, WA: EPA# WAH000011585

BILL OF LADING

No. 193650
Date: 09 Jan 08
Cust ID# 3259

Generator	Name: Universal Applicators		Contact Person: MIA 503-236-6359		Billing Address	Universal Appl.	
	Address: 23 Rd SE Clay Portland OR		City: Portland State: OR Zip: 97202 County: Multnomah			Disp# 3435	
Transportation	Consigned To: Fuel Processors					Check#	PO#
	Destination: 4150 N. Suttle Rd Portland						
Via Carrier: ORRICO					Profile Date: DHachen		
Driver: Joe Truck # 2483 Miles Run:					Load Ticket #		
Gal./Brl.	Description	Sniffer P / F	CDT / HCDT	pH	Flash Point	Rate per Gal./Brl.	Rate per Hour
70	city water	P	/	8	7200		
2	truck time						
Above material being transported for Recycling EPA# None						Total:	

Customer warrants that the waste petroleum products being transferred by the above collector do not contain any contaminants including, without limitation, pesticides, chlorinated solvents at concentrations greater than 1000 PPM, PCBs at concentrations greater than 2 PPM (or 50 PPM with Analytical), or any other material classified as hazardous waste by 40 CFR part 261, Subparts C and D (implementing the federal Resource Conservation and Recovery Act), or by any equivalent state hazardous substance classification program. Should Laboratory tests find this waste not in compliance with 40 CFR Part 261, customer (generator) agrees to pay for all disposal costs incurred.

SIGNED X DATE:

Headquarters
4150 N. Suttle Road
Portland, Oregon 97217
Phone 503-286-8352
Toll Free 800-367-8894
EPA# ORD980975692



Eugene, OR: EPA# ORQ000024941
Hoquiam, WA: EPA# WAD988519419
Klamath Falls, OR: EPA# ORD980980775
Kennewick, WA: EPA# WAH000011577
Medford, OR: EPA# ORD987197092
North Bend, OR: EPA# ORD980978266
Salt Lake City, UT: EPA# UTD982589459
Spokane, WA: EPA# WAH000011585

BILL OF LADING

No. 193534
Date: 7-14-08
Cust ID#

Generator	Name: City of Portland		Contact Person: Phil		Billing Address	Universal Applicators	
	Address: 1204 SE Clay Portland OR		City: Portland State: OR Zip: 97202 County: Multnomah			Check# PO#	
Transportation	Consigned To: Fuel Processors					Check#	PO#
	Destination: 4150 N. Suttle Rd Portland						
Via Carrier: ORRICO					Profile Date: 7-14-08		
Driver: Joe Truck # 1366 Miles Run:					Load Ticket #		
Gal./Brl.	Description	Sniffer P / F	CDT / HCDT	pH	Flash Point	Rate per Gal./Brl.	Rate per Hour
300	emul. fuel for 1	P	/	7	1200	30	70
Stop 1/4						50	
Above material being transported for Recycling EPA# 1204 SE						Total: 1250	

Customer warrants that the waste petroleum products being transferred by the above collector do not contain any contaminants including, without limitation, pesticides, chlorinated solvents at concentrations greater than 1000 PPM, PCBs at concentrations greater than 2 PPM (or 50 PPM with Analytical), or any other material classified as hazardous waste by 40 CFR part 261, Subparts C and D (implementing the federal Resource Conservation and Recovery Act), or by any equivalent state hazardous substance classification program. Should Laboratory tests find this waste not in compliance with 40 CFR Part 261, customer (generator) agrees to pay for all disposal costs incurred.

SIGNED X DATE: 7-14-08

RISK-BASED CONCENTRATIONS

Contaminated Medium Exposure Pathway Receptor Scenario Direct or Indirect Pathway (see notes)	Soil mg/kg (ppm) RBC _{soil}	Soil Ingestion: Dermal Contact and Inhalation RBC _{soil}	Soil mg/kg (ppm) RBC _{soil}									
			Vandalization to Outdoor Air									
			RBC _{soil}									
			DC	DC	DC	DC	DC	DC	DC	DC	DC	DC
Contaminant of Concern	Type	Residential	Urban Residential		Occupational		Construction Worker		Excavation Worker		Residential	
			DC	DC	DC	DC	DC	DC	DC	DC	DC	DC
Acenaphthene	NC, V	4,700	9,400	51,000	19,000	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Acrylonitrile	C, V	1.2	3.1	5.3	40	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Aldrin	C, RV	0.029	0.076	0.13	0.98	27	27	27	27	27	27	27
Anthracene	NC, V	23,000	47,000	170,000	93,000	370	370	370	370	370	370	370
Arsenic	C, RV	0.39	1.0	1.7	13	59	59	59	59	59	59	59
Barium	NC, RV	16,000	31,000	110,000	62,000	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Benz[a]anthracene	C, RV	0.15	0.31	2.7	21	590	590	590	590	590	590	590
Benzene	C, V	12	30	52	390	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Benzidine	C, RV	0.00550	0.0010	0.0054	0.073	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Benzofluoranthene	C, RV	0.015	0.031	0.27	2.1	59	59	59	59	59	59	59
Benzofluoranthene	C, RV	0.15	0.31	2.7	21	590	590	590	590	590	590	590
Beryllium	NC, RV	150	310	2,600	610	17,000	17,000	17,000	17,000	17,000	17,000	17,000
Bis[2-ethylhexyl]phthalate	C, RV	35	93	150	1,200	33,000	33,000	33,000	33,000	33,000	33,000	33,000
Bromochloromethane	C, V	10	27	46	350	9,700	9,700	9,700	9,700	9,700	9,700	9,700
Bromodorm	C, RV	81	210	350	2,700	76,000	76,000	76,000	76,000	76,000	76,000	76,000
Bromomethane	NC, V	110	220	1,400	430	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Bulkybenzene, n-	NC, V	780	1,600	10,000	3,100	89,000	89,000	89,000	89,000	89,000	89,000	89,000
Bulkybenzene, sec-	NC, V	780	1,600	10,000	3,100	89,000	89,000	89,000	89,000	89,000	89,000	89,000
Cadmium	C, RV	1,500	6,400	8,600	350	9,700	9,700	9,700	9,700	9,700	9,700	9,700
Carbon tetrachloride	C, V	4.9	13	22	170	4,600	4,600	4,600	4,600	4,600	4,600	4,600
Chlorobenzene	NC, V	1,600	3,100	20,000	6,200	17,000	17,000	17,000	17,000	17,000	17,000	17,000
Chlorodibromomethane	C, RV	7.6	20	34	280	7,200	7,200	7,200	7,200	7,200	7,200	7,200
Chloroethane	C, V	220	580	930	7,500	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Chloroform	C, V	-	-	-	-	-	-	-	-	-	-	-

RISK-BASED CONCENTRATIONS

Contaminated Medium		SOIL mg/Kg (ppm)						SOIL mg/Kg (ppm)					
Exposure Pathway		Vapor Intrusion into Buildings RBC _{VI}						Leaching to Groundwater RBC _{LG}					
Receptor Scenario		Residential		Urban Residential		Occupational		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		IVS		IVS		IVS		IS		IS		IS	
Contaminant of Concern	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note
Acenaphthene	NC, V	-	>Max	-	>Max	-	>Max	-	<Calc	-	<Calc	-	<Calc
Acrylonitrile	C, V	-	>Max	-	>Max	-	>Max	0.0041	-	0.0081	-	0.025	-
Aldrin	C, RV	-	NV	-	NV	-	NV	0.77	-	1.3	-	-	<Calc
Anthracene	NC, V	-	>Max	-	>Max	-	>Max	-	<Calc	-	<Calc	-	<Calc
Arsenic	C, RV	-	NV	-	NV	-	NV	-	-	-	-	-	-
Barium	NC, RV	-	NV	-	NV	-	NV	-	-	-	-	-	-
Benz[a]anthracene	C, RV	-	NV	-	NV	-	NV	-	<Calc	-	<Calc	-	<Calc
Benzene	C, V	-	>Max	-	>Max	-	>Max	0.13	-	0.26	-	0.81	-
Benzidine	C, RV	-	NV	-	NV	-	NV	0.0012	-	0.0014	-	0.023	-
Benzo[a]pyrene	C, RV	-	NV	-	NV	-	NV	-	<Calc	-	<Calc	-	<Calc
Benzo[b]fluoranthene	C, RV	-	NV	-	NV	-	NV	-	<Calc	-	<Calc	-	<Calc
Benzo[k]fluoranthene	C, RV	-	NV	-	NV	-	NV	-	<Calc	-	<Calc	-	<Calc
Beryllium	NC, RV	-	NV	-	NV	-	NV	-	-	-	-	-	-
Bis(2-ethylhexyl)phthalate	C, RV	-	NV	-	NV	-	NV	-	<Calc	-	<Calc	-	<Calc
Bromodichloromethane	C, V	-	>Max	-	>Max	-	>Max	0.092	-	0.13	-	0.37	-
Bromoform	C, RV	-	NV	-	NV	-	NV	3.5	-	6.0	-	25	-
Bromomethane	NC, V	-	>Max	-	>Max	-	>Max	1.5	-	1.5	-	6.1	-
Butylbenzene, n-	NC, V	-	>Max	-	>Max	-	>Max	-	<Calc	-	<Calc	-	<Calc
Butylbenzene, sec-	NC, V	-	>Max	-	>Max	-	>Max	-	<Calc	-	<Calc	-	<Calc
Cadmium	C, RV	-	NV	-	NV	-	NV	-	-	-	-	-	-
Carbon tetrachloride	C, V	-	>Max	-	>Max	-	>Max	0.18	-	0.35	-	1.1	-
Chlorobenzene	NC, V	-	>Max	-	>Max	-	>Max	100	-	100	-	400	-
Chlorodibromomethane	C, RV	-	NV	-	NV	-	NV	0.25	-	0.43	-	1.8	-
Chloroethane	C, V	-	>Max	-	>Max	-	>Max	0.97	-	2.0	-	5.8	-
Chloroform	C, V	-	>Max	-	>Max	-	>Max	0.049	-	0.11	-	0.28	-

RISK-BASED CONCENTRATIONS

Contaminated Medium		GROUNDWATER µg/L (ppb) Ingestion & Inhalation from Tapwater RBC _{gw}						GROUNDWATER µg/L (ppb) Volatilization to Outdoor Air RBC _{gao}					
Exposure Pathway													
Receptor Scenario		Residential		Urban Residential		Occupational		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		DS		DS		DS		IVW		IVW		IVW	
Contaminant of Concern	Note		Note		Note		Note		Note		Note		Note
Acenaphthene	nc, v	370		370		1,500		-	NS	-	NS	-	NS
Acrylonitrile	c, v	0.038		0.076		0.24		2,700		5,700		15,000	
Aldrin	c, nv	0.0033		0.0058		0.024		-	NV	-	NV	-	NV
Anthracene	nc, v	1,800	NS	1,800	NS	7,300	NS	-	NS	-	NS	-	NS
Arsenic	c, nv	0.038		0.066		0.27		-	NV	-	NV	-	NV
Barium	nc, nv	7,300		7,300		29,000		-	NV	-	NV	-	NV
Benz[a]anthracene	c, nv	0.029		0.033		0.56		-	NV	-	NV	-	NV
Benzene	c, v	0.35		0.70		2.2		2,700		5,800		15,000	
Benzo[a]pyrene	c, nv	0.000094		0.00011		0.0018		-	NV	-	NV	-	NV
Benzo[a]pyrene	c, nv	0.0029		0.0033		0.056		-	NV	-	NV	-	NV
Benzo[b]fluoranthene	c, nv	0.029		0.033		0.56		-	NV	-	NV	-	NV
Benzo[k]fluoranthene	c, nv	0.29		0.33		5.6	NS	-	NV	-	NV	-	NV
Beryllium	nc, nv	73		73		290		-	NV	-	NV	-	NV
Bis(2-ethylhexyl)phthalate	c, nv	4.1		7.0		29		-	NV	-	NV	-	NV
Bromodichloromethane	c, v	0.18		0.38		1.1		4,800		10,000		28,000	
Bromoform	c, nv	7.2		12		52		-	NV	-	NV	-	NV
Bromomethane	nc, v	8.5		8.5		34		46,000		46,000		180,000	
Butylbenzene, n-	nc, v	61		61		240		-	NS	-	NS	-	NS
Butylbenzene, sec-	nc, v	61		61		240		-	NS	-	NS	-	NS
Cadmium	c, nv	-	NS	-	NS	-	NS	-	NV	-	NV	-	NV
Carbon tetrachloride	c, v	0.17		0.33		1.0		400		850		2,300	
Chlorobenzene	nc, v	90		90		360		-	NS	-	NS	-	NS
Chlorodibromomethane	c, nv	0.68		1.2		4.9		-	NV	-	NV	-	NV
Chloroethane	c, v	3.9		8.1		23		13,000		28,000		75,000	
Chloroform	c, v	0.18		0.38		1.0		1,100		2,300		6,000	

RISK-BASED CONCENTRATIONS

Contaminated Medium	GROUNDWATER µg/L (ppb)						GROUNDWATER µg/L (ppb)		AIR µg/m ³					
Exposure Pathway	Vapor Intrusion into Buildings RBC _{VI}						GW in Excavation RBC _{GW}		Inhalation RBC _{air}					
Receptor Scenario	Residential		Urban Residential		Occupational		Construction & Excavation Worker		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)	IW		IW		IW		DS		DP		DP		DP	
Contaminant of Concern	Note		Note		Note		Note		Note		Note		Note	
Acenaphthene	RC, V	-	HS	-	HS	-	HS	25,000	HS	220		220		880
Acrylonitrile	C, V	650		1,400		8,200		230	0.030		0.055		0.17	
Aldrin	C, NV	-	NV	-	NV	-	NV	54	HS	0.00042		0.00090		0.0024
Anthracene	RC, V	-	HS	-	HS	-	HS	79,000	HS	-	HS	-	HS	-
Arsenic	C, NV	-	NV	-	NV	-	NV	5.8		0.00048		0.0010		0.0027
Barium	RC, NV	-	NV	-	NV	-	NV	25,000		730		730		2,900
Benz[a]anthracene	C, NV	-	NV	-	NV	-	NV	9.1	0.0069		0.0079		0.13	
Benzene	C, V	220		470		2,800		1,700	0.27		0.57		1.5	
Benzo[d]pyrene	C, NV	-	NV	-	NV	-	NV	16	9.4E-06		0.00011		0.00018	
Benzo[a]pyrene	C, NV	-	NV	-	NV	-	NV	0.53	0.00069		0.00079		0.013	
Benzo[b]fluoranthene	C, NV	-	NV	-	NV	-	NV	5.2	HS	0.0069		0.0079		0.13
Benzo[k]fluoranthene	C, NV	-	NV	-	NV	-	NV	49	HS	-	HS	-	HS	-
Beryllium	RC, NV	-	NV	-	NV	-	NV	250	0.021		0.021		0.083	
Bis(2-ethylhexyl)phthalate	C, NV	-	NV	-	NV	-	NV	3,100	HS	0.51		1.1		HS
Bromodichloromethane	C, V	910		1,900		11,000		870	0.12		0.25		0.66	
Bromoform	C, NV	-	NV	-	NV	-	NV	150,000		1.9		4.0		11
Bromomethane	RC, V	3,900		3,900		34,000		1,100	5.1		5.1		20	
Butylbenzene, n-	RC, V	-	HS	-	HS	-	HS	2,700	37		37		150	
Butylbenzene, sec-	RC, V	12,000	HS	12,000	HS	-	HS	3,000	37		37		150	
Cadmium	C, NV	-	NV	-	NV	-	NV	-	HS	0.0011		0.0024		0.0065
Carbon tetrachloride	C, V	24		52		310		740	0.14		0.29		0.77	
Chlorobenzene	RC, V	75,000		75,000		-	HS	9,600	51		51		200	
Chlorodibromomethane	C, NV	-	NV	-	NV	-	NV	13,000	0.085		0.18		0.49	
Chloroethane	C, V	940		2,000		12,000		19,000	2.5		5.3		14	
Chloroform	C, V	93		200		1,200		700	0.089		0.19		0.50	

RISK-BASED CONCENTRATIONS

Contaminant Medium	SOIL mg/kg (ppm)									
	Soil Ingestion, Dermal Contact, and Inhalation RBC _{soil}									
	Volatilization to Outdoor Air RBC _{soil}									
	Urban Residential									
Exposure Pathway	Receptor Scenario									
	Direct or Indirect Pathway (see notes)									
Receptor Scenario	Contaminant of Concern									
	Notes									
Contaminant of Concern	Notes									
	Notes									
Chloroethane	C, V									
	C, IV									
Chloroethane	C, IV									
	C, IV									
Chromium (III)	C, IV									
	C, IV									
Chromium (VI)	C, IV									
	C, IV									
Chrysene	C, IV									
	C, IV									
Copper	C, IV									
	C, IV									
Cyanide (hydrogen cyanide) *	C, IV									
	C, IV									
DDD (4,4-Dichlorodiphenylchloroethene)	C, IV									
	C, IV									
DDE (4,4-Dichlorodiphenylchloroethene)	C, IV									
	C, IV									
DDT (4,4-Dichlorodiphenylchloroethane)	C, IV									
	C, IV									
Dibenz(a,h)anthracene	C, IV									
	C, IV									
Dichlorobenzene, 1,2-	C, V									
	C, V									
Dichlorobenzene, 1,3-	C, V									
	C, V									
Dichlorobenzene, 1,4-	C, V									
	C, V									
Dichlorobenzene, 3,3'-	C, IV									
	C, IV									
Dichlorobenzene, 1,1'-	C, V									
	C, V									
Dichloroethene, 1,1'-	C, V									
	C, V									
Dichloroethene, cis-1,2-	C, V									
	C, V									
Dichloroethene, trans-1,2-	C, V									
	C, V									
Dichloroethyl ether	C, V									
	C, V									
Dichloromethane	C, V									
	C, V									
Dichlorophenoxyacetic acid, 2,4-, (2,4-D)	C, IV									
	C, IV									
Dieldrin	C, IV									
	C, IV									
Dinitrobenzene, 2,6-	C, IV									
	C, IV									
Di-n-propylamine	C, IV									
	C, IV									

RISK-BASED CONCENTRATIONS

Contaminated Medium	Exposure Pathway	Receptor Scenario	SOIL mg/kg (ppm)				SOIL mg/kg (ppm)			
			Vapor Intrusion into Buildings RBC _{vi}				Leaching to Groundwater RBC _{gw}			
			Residential	Urban Residential	Occupational	IS	Residential	Urban Residential	Occupational	IS
Contaminant of Concern	Media	IS	IS	IS	IS	IS	IS	IS	IS	IS
			IS	IS	IS	IS	IS	IS	IS	IS
Chloroethane	C, V	-	-	-	-	-	-	-	-	-
Chloroethane	C, IV	-	-	-	-	-	-	-	-	-
Chloroethane	NC, IV	-	-	-	-	-	-	-	-	-
Chromium (III)	C, IV	-	-	-	-	-	-	-	-	-
Chromium (VI)	C, IV	-	-	-	-	-	-	-	-	-
Chrysene	C, IV	-	-	-	-	-	-	-	-	-
Copper	NC, IV	-	-	-	-	-	-	-	-	-
Cyanide (hydrogen cyanide) *	NC, IV	-	-	-	-	-	-	-	-	-
DDD (4,4'-Dichlorodiphenylchloroethene)	C, IV	-	-	-	-	-	-	-	-	-
DDT (4,4'-Dichlorodiphenylchloroethane)	C, IV	-	-	-	-	-	-	-	-	-
Dibenz[a,h]anthracene	C, IV	-	-	-	-	-	-	-	-	-
Dichlorobenzene, 1,2-	NC, V	-	-	-	-	-	-	-	-	-
Dichlorobenzene, 1,3-	NC, V	-	-	-	-	-	-	-	-	-
Dichlorobenzene, 1,4-	C, V	-	-	-	-	-	-	-	-	-
Dichlorobenzene, 3,3'	C, IV	-	-	-	-	-	-	-	-	-
Dichloroethane, 1,1-	NC, V	-	-	-	-	-	-	-	-	-
Dichloroethane, 1,1-	NC, V	-	-	-	-	-	-	-	-	-
Dichloroethene, cis-1,2-	NC, V	-	-	-	-	-	-	-	-	-
Dichloroethene, trans-1,2-	C, V	-	-	-	-	-	-	-	-	-
Dichloroethyl ether	C, V	-	-	-	-	-	-	-	-	-
Dichloromethane	C, V	-	-	-	-	-	-	-	-	-
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	NC, IV	-	-	-	-	-	-	-	-	-
Dieldrin	C, IV	-	-	-	-	-	-	-	-	-
Dinitrobenzene, 2,6-	NC, IV	-	-	-	-	-	-	-	-	-
Dimethylsiloxane	C, IV	-	-	-	-	-	-	-	-	-

RISK-BASED CONCENTRATIONS

Contaminated Medium		GROUNDWATER µg/L (ppb)						GROUNDWATER µg/L (ppb)					
Exposure Pathway		Ingestion & Inhalation from Tapwater RBC _{GW}						Volatilization to Outdoor Air RBC _{air}					
Receptor Scenario		Residential		Urban Residential		Occupational		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		DS		DS		DS		IVW		IVW		IVW	
Contaminant of Concern	Note		Note		Note		Note		Note		Note		Note
Chloromethane	c, v	2.3		4.9		13		6,700		14,000		38,000	
Chordane	c, nv	0.16		0.28		1.2		-	NV	-	NV	-	NV
Chromium (III)	nc, nv	55,000		55,000		220,000		-	NV	-	NV	-	NV
Chromium (VI)	c, nv	-	>Max	-	>Max	-	>Max	-	NV	-	NV	-	NV
Chrysene	c, nv	2.9	>S	3.3	>S	56	>S	-	NV	-	NV	-	NV
Copper	nc, nv	1,400		1,400		5,400		-	NV	-	NV	-	NV
Cyanide (hydrogen cyanide) *	nc, nv	730		730		2,900		-	NV	-	NV	-	NV
DDD (4,4'-Dichlorodiphenyltrichloroethene)	c, nv	0.24		0.41		1.7		-	NV	-	NV	-	NV
DDE (4,4'-Dichlorodiphenyldichloroethene)	c, nv	0.17		0.29		1.2		-	NV	-	NV	-	NV
DDT (4,4'-Dichlorodiphenyldichloroethane)	c, nv	0.17		0.29		1.2		-	NV	-	NV	-	NV
Dibenz[a,h]anthracene	c, nv	0.0029		0.0033		0.056		-	NV	-	NV	-	NV
Dichlorobenzene, 1,2-	nc, v	50		50		200		-	>S	-	>S	-	>S
Dichlorobenzene, 1,3-	nc, v	15		15		58		-	>S	-	>S	-	>S
Dichlorobenzene, 1,4-	c, v	0.48		0.98		2.8		6,600		14,000		37,000	
Dichlorobenzidine, 3,3'-	c, nv	0.13		0.22		0.91		-	NV	-	NV	-	NV
Dichloroethane, 1,1-	nc, v	1,200		1,200		4,900		-	>S	-	>S	-	>S
Dichloroethene, 1,1-	nc, v	340		340		1,400		600,000		600,000		-	>S
Dichloroethene, cis-1,2-	nc, v	61		61		240		490,000		490,000		1,900,000	
Dichloroethene, trans-1,2-	nc, v	110		110		420		480,000		480,000		1,900,000	
Dichloroethylether	c, v	0.010		0.021		0.059		6,800		15,000		39,000	
Dichloromethane	c, v	4.1		7.8		26		71,000		150,000		400,000	
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	nc, nv	370		370		1,500		-	NV	-	NV	-	NV
Dieldrin	c, nv	0.0035		0.0061		0.026		-	NV	-	NV	-	NV
Dimethyltoluene, 2,6-	nc, nv	37		37		150		-	NV	-	NV	-	NV
Di-n-propylnitrosamine	c, nv	0.0081		0.014		0.058		-	NV	-	NV	-	NV

RISK-BASED CONCENTRATIONS

Contaminated Medium		GROUNDWATER µg/L (ppb)						GROUNDWATER µg/L (ppb)		AIR µg/m ³					
Exposure Pathway		Vapor Intrusion into Buildings RBC _{vi}						GW in Excavation RBC _{ex}		Inhalation RBC _{in}					
Receptor Scenario		Residential		Urban Residential		Occupational		Construction & Excavation Worker		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		IWV		IWV		IWV		DS		DP		DP		DP	
Contaminant of Concern	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note
Chloromethane	C, V	430		930		5,400		9,000		1.1		2.4		6.5	
Chordane	C, NV	-	NV	-	NV	-	NV	73	>5	0.020		0.044		0.12	
Chromium (III)	nc, NV	-	NV	-	NV	-	NV	190,000		-	>Max	-	>Max	-	>Max
Chromium (VI)	C, NV	-	NV	-	NV	-	NV	-	>Max	0.000024		0.000052		0.00014	
Chrysene	C, NV	-	NV	-	NV	-	NV	910	>5	0.69		0.79		-	>5
Copper	nc, NV	-	NV	-	NV	-	NV	4,600		-	>Max	-	>Max	-	>Max
Cyanide (hydrogen cyanide) *	nc, NV	-	NV	-	NV	-	NV	2,500		3.1		3.1		13	
DDD (4,4'-Dichlorodiphenyltrichloroethene)	C, NV	-	NV	-	NV	-	NV	40		0.030		0.064		0.17	
DDE (4,4'-Dichlorodiphenyldichloroethene)	C, NV	-	NV	-	NV	-	NV	32		0.021		0.045		0.12	
DDT (4,4'-Dichlorodiphenyldichloroethane)	C, NV	-	NV	-	NV	-	NV	15		0.021		0.045		0.12	
Dibenz[a,h]anthracene	C, NV	-	NV	-	NV	-	NV	0.21		-	>5	-	>5	-	>5
Dichlorobenzene, 1,2-	nc, V	75,000	>5	75,000	>5	-	>5	5,400		25		25		100	
Dichlorobenzene, 1,3-	nc, V	20,000	>5	20,000	>5	-	>5	1,300		8.4		8.4		34	
Dichlorobenzene, 1,4-	C, V	710		1,500		8,800		1,600		0.30		0.64		1.7	
Dichlorobenzidine, 3,3'-	C, NV	-	NV	-	NV	-	NV	490		0.016		0.034		0.091	
Dichloroethane, 1,1-	nc, V	710,000	>Max	710,000	>Max	-	>5	160,000		730		730		2,900	
Dichloroethene, 1,1-	nc, V	38,000		38,000		330,000		41,000		210		210		830	
Dichloroethene, cis-1,2-	nc, V	48,000		48,000		420,000		7,600		37		37		150	
Dichloroethene, trans-1,2-	nc, V	38,000		38,000		340,000		13,000		62		62		250	
Dichloroethylether	C, V	1,900		4,100		24,000		48		0.0062		0.013		0.035	
Dichloromethane	C, V	7,900		17,000		99,000		31,000		4.5		9.6		26	
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	nc, NV	-	NV	-	NV	-	NV	72,000		37		37		150	
Dieldrin	C, NV	-	NV	-	NV	-	NV	6.1		0.00045		0.00096		0.0026	
Dinitrotoluene, 2,6-	nc, NV	-	NV	-	NV	-	NV	29,000		3.7		3.7		15	
Di-n-propylnitrosamine	C, NV	-	NV	-	NV	-	NV	340		0.0010		0.0022		0.0058	

RISK-BASED CONCENTRATIONS

Contaminated Medium Exposure Pathway Receptor Scenario	SOIL mg/kg (ppm) Soil Ingestion, Dermal Contact, and Inhalation RBC _{soil}										SOIL mg/kg (ppm) Volatilization to Outdoor Air RBC _{soil}			
	Soil Ingestion, Dermal Contact, and Inhalation RBC _{soil}										Soil Ingestion, Dermal Contact, and Inhalation RBC _{soil}			
	Residential	Urban Residential	Occupational	Construction Worker	Excavation Worker	Residential	Urban Residential	Occupational	Construction Worker	Excavation Worker	Residential	Urban Residential	Occupational	Occupational
Direct or Indirect Pathway (see notes)	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC
Contaminant of Concern	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note	Note
Chlorine, 1,4-	53	140	240	1,800	50,000	-	-	-	-	-	-	-	-	-
Diphenyltinamine	c, nv	270	440	3,400	<Cal	-	-	-	-	-	-	-	-	-
EDB (1,2-dibromoethane)	c, v	0.84	1.4	11	300	-	-	-	-	-	-	-	-	-
EDC (1,2-dichloroethane)	c, v	7.0	18	31	240	-	-	-	-	-	-	-	-	-
Endosulfan, (alpha-beta)	nc, nv	370	730	4,600	<Cal	-	-	-	-	-	-	-	-	-
Endrin	nc, nv	18	37	230	71	2,000	-	-	-	-	-	-	-	-
Ethylbenzene	nc, v	7,800	16,000	100,000	<Cal	-	-	-	-	-	-	-	-	-
Fluorene	nc, nv	2,300	4,600	29,000	<Cal	-	-	-	-	-	-	-	-	-
Fluorene	nc, v	3,100	6,300	41,000	<Cal	-	-	-	-	-	-	-	-	-
Formaldehyde	c, nv	14	36	62	470	13,000	-	-	-	-	-	-	-	-
Heptachlor	c, nv	0.11	0.29	0.48	3.7	100	-	-	-	-	-	-	-	-
Heptachlor Epoxide	c, nv	0.653	0.14	0.24	1.8	51	-	-	-	-	-	-	-	-
Hexachlorobenzene	c, nv	0.40	1.0	1.8	14	380	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene, alpha- (alpha-HCH)	c, nv	0.077	0.21	0.34	2.6	74	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene, gamma- (Lindane)	c, nv	0.37	1.00	1.7	13	360	-	-	-	-	-	-	-	-
Hexachloroethane	c, nv	35	93	160	1,200	33,000	-	-	-	-	-	-	-	-
Indene, 1,2,3-cdipyrrene	c, nv	0.15	0.31	2.7	21	550	-	-	-	-	-	-	-	-
Lead	NA, nv	400	400	800	800	800	-	-	-	-	-	-	-	-
Manganese	nc, nv	3,300	6,600	41,000	14,000	3,300	-	-	-	-	-	-	-	-
MCPA (4-chloro-2-methylphenoxyacetic acid)	nc, nv	31	61	380	120	3,300	-	-	-	-	-	-	-	-
Mercury	nc, nv	23	47	310	93	2,600	-	-	-	-	-	-	-	-
MTBE (methyl t-butyl ether)	c, v	350	930	1,600	12,000	<Cal	-	-	-	-	-	-	-	-
Naphthalene	nc, v	1,600	3,100	20,000	6,200	<Cal	-	-	-	-	-	-	-	-
Nickel	nc, nv	1,600	3,100	20,000	6,200	<Cal	-	-	-	-	-	-	-	-
Pentachlorophenol	c, nv	3.0	8.1	13	100	2,900	-	-	-	-	-	-	-	-

RISK-BASED CONCENTRATIONS

Contaminated Medium				SOIL mg/Kg (ppm) Vapor Intrusion into Buildings RBC _{soil}						SOIL mg/Kg (ppm) Leaching to Groundwater RBC _{gw}					
Exposure Pathway															
Receptor Scenario				Residential		Urban Residential		Occupational		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)				IVS		IVS		IVS		IS		IS		IS	
Contaminant of Concern	Route		Note		Note		Note		Note		Note		Note		Note
Dioxane, 1,4-	C, IV	-	NV	-	NV	-	NV	-	NV	0.37		0.64		2.7	
Diphenylhydrosamine	C, IV	-	NV	-	NV	-	NV	-	NV	71		120		-	<Det
EDB (1,2-dibromoethane)	C, V	-	>Max	-	>Max	-	>Max	-	>Max	0.0012		0.0024		0.0069	
EDC (1,2-dichloroethane)	C, V	-	>Max	-	>Max	-	>Max	-	>Max	0.019		0.040		0.12	
Endosulfan, (alpha-beta)	nc, IV	-	NV	-	NV	-	NV	-	NV	-	<Det	-	<Det	-	<Det
Endrin	nc, IV	-	NV	-	NV	-	NV	-	NV	-	<Det	-	<Det	-	<Det
Ethylbenzene	nc, V	-	>Max	-	>Max	-	>Max	-	>Max	-	<Det	-	<Det	-	<Det
Fluoranthene	nc, IV	-	NV	-	NV	-	NV	-	NV	-	<Det	-	<Det	-	<Det
Fluorene	nc, V	-	>Max	-	>Max	-	>Max	-	>Max	-	<Det	-	<Det	-	<Det
Formaldehyde	C, IV	-	NV	-	NV	-	NV	-	NV	0.088		0.15		0.64	
Heptachlor	C, IV	-	NV	-	NV	-	NV	-	NV	84		150		610	
Heptachlor Epoxide	C, IV	-	NV	-	NV	-	NV	-	NV	2.5		4.3		18	
Hexachlorobenzene	C, IV	-	NV	-	NV	-	NV	-	NV	9.2		16		66	
Hexachlorocyclohexane, alpha- (alpha-HCH)	C, IV	-	NV	-	NV	-	NV	-	NV	0.076		0.13		0.54	
Hexachlorocyclohexane, gamma- (Lindane)	C, IV	-	NV	-	NV	-	NV	-	NV	0.22		0.39		1.6	
Hexachloroethane	C, IV	-	NV	-	NV	-	NV	-	NV	35		60		250	
Indeno[1,2,3-cd]pyrene	C, IV	-	NV	-	NV	-	NV	-	NV	-	<Det	-	<Det	-	<Det
Lead	NA, IV	-	NV	-	NV	-	NV	-	NV	30	L	30	L	30	L
Manganese	nc, IV	-	NV	-	NV	-	NV	-	NV	*		*		*	
MCPA ((4-chloro-2-methylphenoxy)acetic acid)	nc, IV	-	NV	-	NV	-	NV	-	NV	3.8		3.8		15	
Mercury	nc, IV	-	NV	-	NV	-	NV	-	NV	*		*		*	
MTBE (methyl t-butyl ether)	C, V	-	>Max	-	>Max	-	>Max	-	>Max	1.3		2.6		7.9	
Naphthalene	nc, V	-	>Max	-	>Max	-	>Max	-	>Max	59		59		240	
Nickel	nc, IV	-	NV	-	NV	-	NV	-	NV	*		*		*	
Pentachlorophenol	C, IV	-	NV	-	NV	-	NV	-	NV	7.6		13		55	

RISK-BASED CONCENTRATIONS

Contaminated Medium Exposure Pathway Receptor Scenario Direct or Indirect Pathway (see notes) Contaminant of Concern	GROUNDWATER µg/L (ppb) Ingestion & Inhalation from Tapwater RBC ₁₀₀				GROUNDWATER µg/L (ppb) Volatilization to Outdoor Air RBC ₁₀₀			
	Residential		Occupational		Residential		Occupational	
	DS		DS		DS		DS	
	Note	Note	Note	Note	Note	Note	Note	Note
Dioxane, 1,4-	C, IV	5.2	8.9	37	NI	NI	NI	NI
Diphenylpicramide	C, IV	12	20	83	NI	NI	NI	NI
EDB (1,2-dibromoethane)	C, V	0.0057	0.012	0.034	270	580	1,500	1,500
EDC (1,2-dichloroethane)	C, V	0.13	0.26	0.75	2,100	4,500	12,000	12,000
Endosulfan, (alpha-beta)	nc, IV	220	220	880	NI	NI	NI	NI
Endrin	nc, IV	11	11	44	NI	NI	NI	NI
Ethylbenzene	nc, V	1,300	1,300	5,400	NI	NI	NI	NI
Fluorethylene	nc, IV	1,500	1,500	5,800	NI	NI	NI	NI
Fluorene	nc, V	240	240	970	NI	NI	NI	NI
Formaldehyde	C, IV	1.2	2.1	8.9	NI	NI	NI	NI
Heptachlor	C, IV	0.013	0.022	0.091	NI	NI	NI	NI
Heptachlor Epoxide	C, IV	0.0092	0.011	0.045	NI	NI	NI	NI
Hexachlorobenzene	C, IV	0.035	0.061	0.26	NI	NI	NI	NI
Hexachlorocyclohexane, alpha-(alpha-HCH)	C, IV	0.0090	0.016	0.065	NI	NI	NI	NI
Hexachlorocyclohexane, gamma-(Lindane)	C, IV	0.044	0.076	0.31	NI	NI	NI	NI
Hexachloroethane	C, IV	4.1	7.0	29	NI	NI	NI	NI
Indeno[1,2,3-cd]pyrene	C, IV	0.028	0.033	0.55	NI	NI	NI	NI
Lead	NA, IV	15	15	15	NI	NI	NI	NI
Manganese	nc, IV	1,700	1,700	6,900	NI	NI	NI	NI
MCPA (4-chloro-2-methylphenoxyacetic acid)	nc, IV	18	18	73	NI	NI	NI	NI
Mercury	nc, IV	11	11	44	NI	NI	NI	NI
MTBE (methyl t-butyl ether)	C, V	11	21	64	270,000	590,000	1,500,000	1,500,000
Naphthalene	nc, V	6.2	6.2	25	NI	NI	NI	NI
Nickel	nc, IV	730	730	2,900	NI	NI	NI	NI
Pentachlorophenol	C, IV	0.47	0.82	3.4	NI	NI	NI	NI

RISK-BASED CONCENTRATIONS

Contaminated Medium		GROUNDWATER µg/L (ppb)						GROUNDWATER µg/L (ppb)	AIR µg/m ³					
Exposure Pathway		Vapor Intrusion into Buildings RBC _{vi}						GW in Excavation RBC _{gw}	Inhalation RBC _{air}					
Receptor Scenario		Residential		Urban Residential		Occupational		Construction & Excavation Worker	Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		INW		INW		INW		DS	DP		DP		DP	
Contaminant of Concern	Note		Note		Note		Note		Note		Note		Note	
Dioxane, 1,4-	c, nv	-	NV	-	NV	-	NV	1,600,000		0.65		1.4		3.7
Diphenylnitrosamine	c, nv	-	NV	-	NV	-	NV	52,000	>S	1.5		3.1		8.3
EDB (1,2-dibromoethane)	c, v	57		120		710		28		0.0036		0.0077		0.020
EDC (1,2-dichloroethane)	c, v	300		640		3,700		600		0.079		0.17		0.45
Endosulfan, (alpha-beta)	nc, nv	-	NV	-	NV	-	NV	30,000	>S	22		22		88
Endrin	nc, nv	-	NV	-	NV	-	NV	420	>S	1.1		1.1		4.4
Ethylbenzene	nc, v	-	>S	-	>S	-	>S	110,000		1,100		1,100		4,200
Fluoranthene	nc, nv	-	NV	-	NV	-	NV	9,600	>S	-	>Py	-	>Py	>Py
Fluorene	nc, v	-	>S	-	>S	-	>Max	14,000	>S	150		150		580
Formaldehyde	c, nv	-	NV	-	NV	-	NV	91,000		0.16		0.33		0.89
Heptachlor	c, nv	-	NV	-	NV	-	NV	32		0.0016		0.0033		0.0089
Heptachlor Epoxide	c, nv	-	NV	-	NV	-	NV	3.2		0.00079		0.0017		0.0045
Hexachlorobenzene	c, nv	-	NV	-	NV	-	NV	10		0.0045		0.0096		0.026
Hexachlorocyclohexane, alpha- (alpha-HCH)	c, nv	-	NV	-	NV	-	NV	28		0.0011		0.0024		0.0065
Hexachlorocyclohexane, gamma- (Lindane)	c, nv	-	NV	-	NV	-	NV	150		0.0055		0.012		0.031
Hexachloroethane	c, nv	-	NV	-	NV	-	NV	7,000		0.51		1.1		2.9
Indeno[1,2,3-cd]pyrene	c, nv	-	NV	-	NV	-	NV	2.9	>S	-	>Py	-	>Py	>Py
Lead	NA, nv	-	NV	-	NV	-	NV	-		-		-		-
Manganese	nc, nv	-	NV	-	NV	-	NV	5,900		0.051		0.051		0.20
MCPA (4-chloro-2-methylphenoxy)acetic acid)	nc, nv	-	NV	-	NV	-	NV	6,600		1.8		1.8		7.3
Mercury	nc, nv	-	NV	-	NV	-	NV	37		0.31		0.31		1.3
MTBE (methyl t-butyl ether)	c, v	46,000		96,000		570,000		59,000		7.9		17		45
Naphthalene	nc, v	-	>S	-	>S	-	>S	680		3.1		3.1		13
Nickel	nc, nv	-	NV	-	NV	-	NV	12,000		-	>Max	-	>Max	>Max
Pentachlorophenol	c, nv	-	NV	-	NV	-	NV	52		0.060		0.13		0.34

RISK-BASED CONCENTRATIONS

Contaminated Medium		SOIL mg/Kg (ppm)										SOIL mg/Kg (ppm)					
Exposure Pathway		Soil Ingestion, Dermal Contact, and Inhalation RBC _{soil}										Volatilization to Outdoor Air RBC _{soil}					
Receptor Scenario		Residential		Urban Residential		Occupational		Construction Worker		Excavation Worker		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		DC		DC		DC		DC		DC		IVS		IVS		IVS	
Contaminant of Concern	Note		Note		Note		Note		Note		Note		Note		Note		Note
Polychlorinated biphenyls (PCBs)	c, nv	0.22		0.60		0.98		7.6		210		-	NV	-	NV	-	NV
Propylbenzene, iso-	nc, v	7,800	<Det	16,000	<Det	100,000	<Det	31,000	<Det	-	<Det	-	<Det	-	<Det	-	<Det
Propylbenzene, n-	nc, v	780	<Det	1,600	<Det	10,000	<Det	3,100	<Det	86,000	<Det	-	<Det	-	<Det	-	<Det
Pyrene	nc, nv	1,700	<Det	3,400	<Det	21,000	<Det	6,700	<Det	-	<Det	-	NV	-	NV	-	NV
Silver	nc, nv	390		780		5,100		1,500		43,000		-	NV	-	NV	-	NV
Styrene	nc, v	16,000	<Det	31,000	<Det	-	<Det	62,000	<Det	-	<Det	-	<Det	-	<Det	-	<Det
TCDD, 2,3,7,8- (Dioxin)	c, nv	3.9E-06		0.000010		0.000017		0.00013		0.0037		-	NV	-	NV	-	NV
Tetrachloroethene (PCE)	c, v	1.2		3.1		5.3		40		1,100		140		-	<Det	-	<Det
Toluene	nc, v	6,300	<Det	13,000	<Det	82,000	<Det	25,000	<Det	-	<Det	-	<Det	-	<Det	-	<Det
Toxaphene	c, nv	0.44		1.2		2.0		15		420		-	NV	-	NV	-	NV
Trichloro-1,2,2-trifluoroethane, 1,1,2- (Freon 113)	nc, v	-	<Det	-	<Det	-	<Det	-	<Det	-	<Det	-	<Det	-	<Det	-	<Det
Trichloroethane, 1,1,1-	nc, v	2,200	<Det	4,400	<Det	29,000	<Det	8,700	<Det	-	<Det	-	<Det	-	<Det	-	<Det
Trichloroethane, 1,1,2-	nc, v	310		630		4,100	<Det	1,200		34,000	<Det	-	<Det	-	<Det	-	<Det
Trichloroethene	c, v	1.6		4.2		7.2		54		1,500	<Det	7.6		16		43	
Trichlorofluoromethane (Freon 11)	nc, v	23,000	<Det	47,000	<Det	-	<Det	93,000	<Det	-	<Det	-	<Det	-	<Det	-	<Det
Trichlorophenol, 2,4,6-	c, nv	44		120		200		1,500		42,000	<Det	-	NV	-	NV	-	NV
Trimethylbenzene, 1,2,4-	nc, v	3,900	<Det	7,800	<Det	51,000	<Det	15,000	<Det	-	<Det	-	<Det	-	<Det	-	<Det
Trimethylbenzene, 1,3,5-	nc, v	3,900	<Det	7,800	<Det	51,000	<Det	15,000	<Det	-	<Det	-	<Det	-	<Det	-	<Det
Vinyl chloride	c, v	0.35		0.78		4.0		30		840		63		76		-	<Det
Xylenes	nc, v	16,000	<Det	31,000	<Det	-	<Det	62,000	<Det	-	<Det	-	<Det	-	<Det	-	<Det

RISK-BASED CONCENTRATIONS

Contaminated Medium		SOIL mg/Kg (ppm)						SOIL mg/Kg (ppm)					
Exposure Pathway		Vapor Intrusion into Buildings RBC _{iv}						Leaching to Groundwater RBC _{gw}					
Receptor Scenario		Residential		Urban Residential		Occupational		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		IVS		IVS		IVS		IS		IS		IS	
Contaminant of Concern	Note		Note		Note		Note		Note		Note		Note
Polychlorinated biphenyls (PCBs)	C, IV	-	NV	-	IV	-	IV	-	<Cal	-	<Cal	-	<Cal
Propylbenzene, iso-	nc, V	-	>Max	-	>Max	-	>Max	-	<Cal	-	<Cal	-	<Cal
Propylbenzene, n-	nc, V	-	>Max	-	>Max	-	>Max	-	<Cal	-	<Cal	-	<Cal
Pyrene	nc, IV	-	NV	-	IV	-	NV	-	<Cal	-	<Cal	-	<Cal
Silver	nc, IV	-	NV	-	NV	-	NV	-	*	-	*	-	*
Styrene	nc, V	-	>Max	-	>Max	-	>Max	-	<Cal	-	<Cal	-	<Cal
TCDD, 2,3,7,8- (Dioxin)	C, IV	-	NV	-	NV	-	IV	0.00026		0.00045		0.0019	
Tetrachloroethene (PCE)	C, V	-	>Max	-	>Max	-	>Max	0.083		0.15		0.58	
Toluene	nc, V	-	>Max	-	>Max	-	>Max	-	<Cal	-	<Cal	-	<Cal
Toxaphene	C, IV	-	NV	-	NV	-	IV	63		110		450	
Trichloro-1,2,2-trifluoroethane, 1,1,2- (Freon 113)	nc, V	-	>Max	-	>Max	-	>Max	-	<Cal	-	<Cal	-	<Cal
Trichloroethane, 1,1,1-	nc, V	-	>Max	-	>Max	-	>Max	580		580		-	
Trichloroethane, 1,1,2-	nc, V	-	>Max	-	>Max	-	>Max	7.5		7.5		30	
Trichloroethene	C, V	-	>Max	-	>Max	-	>Max	0.026		0.054		0.16	
Trichlorofluoromethane (Freon 11)	nc, V	-	>Max	-	>Max	-	>Max	-	<Cal	-	<Cal	-	<Cal
Trichlorophenol, 2,4,6-	C, IV	-	NV	-	NV	-	IV	29		51		210	
Trimethylbenzene, 1,2,4-	nc, V	-	>Max	-	>Max	-	>Max	220		220		870	
Trimethylbenzene, 1,3,5-	nc, V	-	>Max	-	>Max	-	>Max	49		49		200	
Vinyl chloride	C, V	-	>Max	-	>Max	-	>Max	0.0079		0.0093		0.16	
Xylenes	nc, V	-	>Max	-	>Max	-	>Max	-	<Cal	-	<Cal	-	<Cal

RISK-BASED CONCENTRATIONS

Contaminated Medium		GROUNDWATER µg/L (ppb)						GROUNDWATER µg/L (ppb)					
Exposure Pathway		Ingestion & Inhalation from Tapwater RBC _{tap}						Volatilization to Outdoor Air RBC _{out}					
Receptor Scenario		Residential		Urban Residential		Occupational		Residential		Urban Residential		Occupational	
Direct or Indirect Pathway (see notes)		DS		DS		DS		IVW		IVW		IVW	
Contaminant of Concern	Note		Note		Note		Note		Note		Note		Note
Polychlorinated biphenyls (PCBs)	c, nv	0.028		0.049		0.20		-	NV	-	NV	-	NV
Propylbenzene, iso-	nc, v	660		660		2,600		-	>S	-	>S	-	>S
Propylbenzene, n-	nc, v	61		61		240		-	>S	-	>S	-	>S
Pyrene	nc, nv	1,100	>S	1,100	>S	4,400	>S	-	NV	-	NV	-	NV
Silver	nc, nv	180		180		730		-	NV	-	NV	-	NV
Styrene	nc, v	1,600		1,600		6,600		-	>S	-	>S	-	>S
TCDD, 2,3,7,8- (Dioxin)	c, nv	3.8E-07		6.6E-07		2.7E-06		-	NV	-	NV	-	NV
Tetrachloroethene (PCE)	c, v	0.091		0.16		0.63		1,700		3,600		9,600	
Toluene	nc, v	2,300		2,300		9,100		-	>S	-	>S	-	>S
Toxaphene	c, nv	0.052		0.085		0.37		-	NV	-	NV	-	NV
Trichloro-1,2,2-trifluoroethane, 1,1,2- (Freon 113)	nc, v	59,000		59,000		240,000	>S	-	>S	-	>S	-	>S
Trichloroethane, 1,1,1-	nc, v	840		840		3,300		-	>S	-	>S	-	>S
Trichloroethane, 1,1,2-	nc, v	24		24		97		500,000		500,000		2,000,000	
Trichloroethene	c, v	0.029		0.059		0.17		130		280		730	
Trichlorofluoromethane (Freon 11)	nc, v	1,300		1,300		5,200		640,000		640,000		-	>S
Trichlorophenol, 2,4,6-	c, nv	5.2		8.9		37		-	NV	-	NV	-	NV
Trimethylbenzene, 1,2,4-	nc, v	12		12		49		-	>S	-	>S	-	>S
Trimethylbenzene, 1,3,5-	nc, v	12		12		49		-	>S	-	>S	-	>S
Vinyl chloride	c, v	0.025		0.029		0.51		400		480		7,000	
Xylenes	nc, v	210		210		820		-	>S	-	>S	-	>S

RISK-BASED CONCENTRATIONS

Contaminant of Concern	GROUNDWATER				GROUNDWATER				AIR			
	Vapor Intrusion into Buildings				GW in Excavation				Inhalation			
	RBC _{GW}				RBC _{GW}				RBC _{GW}			
	Residential	Urban Residential	Occupational	Notes	Construction & Excavation	Urban Residential	Occupational	Notes	Residential	Urban Residential	Occupational	Notes
Exposure Pathway	IVW	IVW	IVW	Notes	DS	DP	DP	Notes	DP	DP	DP	Notes
Receptor Scenario	NC, NV	NC, NV	NC, NV	Notes	NC, NV	NC, NV	NC, NV	Notes	NC, NV	NC, NV	NC, NV	Notes
Direct or Indirect Pathway (see notes)	NC, NV	NC, NV	NC, NV	Notes	NC, NV	NC, NV	NC, NV	Notes	NC, NV	NC, NV	NC, NV	Notes
Polychlorinated biphenyls (PCBs)	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Propylbenzene, iso-	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Propylbenzene, n-	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Pyrene	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Silver	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Styrene	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
TCDD, 2,3,7,8- (Dioxin)	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Tetrachloroethene (PCE)	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Toluene	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Toxaphene	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trichloro-1,2,2-trifluoroethane, 1,1,2- (Freon 113)	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trichloroethane, 1,1,1-	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trichloroethane, 1,1,2-	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trichloroethene	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trichlorofluoromethane (Freon 11)	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trichlorophenol, 2,4,6-	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trimethylbenzene, 1,2,4-	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Trimethylbenzene, 1,3,5-	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Vinyl chloride	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV
Xylenes	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV	NC, NV

Exposure Factors: Reasonable Maximum Exposure

Parameter (unit)	Symbol	Residential		Urban Residential		Occupational		Construction Worker		Excavation Worker	
			Note		Note		Note		Note		Note
ACCEPTABLE RISK LEVELS											
Acceptable Risk Level - Carcinogens	ARLc	1.00E-06	1	=		=		=		=	
Acceptable Risk Level - Noncarcinogens	ARLn	1	1	=		=		=		=	
EXPOSURE PARAMETERS											
Averaging Time - Carcinogen (yr)	ATc	70	2	=		=		=		=	
Averaging Time - Noncarcinogen (yr)	ATn	30	2	11	2	25	2	1	2	1	2
Averaging Time - Noncarcinogen, Child (yr)	ATnc	6	2	6	2	NA		NA		NA	
Body Weight - Adult (kg)	BWa	70	3	=		=		=		=	
Body Weight - Child (kg)	BWc	15	3	=		NA		NA		NA	
Exposure Duration - Adult (yr)	ED	30	3	11	4	25	3	1	21	1	6
Exposure Duration - Child (yr)	EDc	6	3	6	4	NA		NA		NA	
Exposure Frequency (day/yr)	EF	350	3	175	3a	250	6	250	6	9	6
Event Frequency - Groundwater (events/day)	EvFwe	NA		NA		NA		2	6	=	
Event Time - Groundwater (hr/event)	t _{event}	NA		NA		NA		2	6	=	
Inhalation Rate - Adult (m ³ /day)	IRA	20	4	20	4	7	4a	7	4a	7	4a
Inhalation Rate - Child (m ³ /day)	IRAc	8.3	4	=		NA		NA		NA	
Soil Ingestion Rate - Adult (mg/day)	IRS	100	6	100	6	100	6	330	21	330	21
Soil Ingestion Rate - Child (mg/day)	IRSc	200	4	200	4	NA		NA		NA	
Water Ingestion Rate - Adult (L/day)	IRW	2.0	2	2.0	2	0.7	4a	NA		NA	
Water Ingestion Rate - Child (L/day)	IRWc	1.5	2	=		NA		NA		NA	
Skin Surface Area - Adult to Soil (cm ²)	SA	5700	4	5700	4	3300	4	3300	4	3300	4
Skin Surface Area - Child to Soil (cm ²)	SAC	2800	4	=		NA		NA		NA	
Skin Surface Area - Adult to Groundwater (cm ²)	SAw	NA		NA		NA		5700	4	5700	4
Soil to Skin Adherence Factor - Adult (mg/cm ² -day)	AF	0.07	5a	0.07	5a	0.10	5b	0.30	5c	0.30	5c
Soil to Skin Adherence Factor - Child (mg/cm ² -day)	AFc	0.20	5d	=		NA		NA		NA	
AGE-ADJUSTED EXPOSURE FACTORS											
Inhalation Factor - Air (m ³ -yr/kg-d)	IFAadj	10.18	7	4.75	7a	NA		NA		NA	
Ingestion Factor - Soil (mg-yr/kg-d)	IFSadj	114	7	87	7a	NA		NA		NA	
Ingestion Factor - Water (L-yr/kg-d)	IFWadj	1.29	7	0.74	7a	NA		NA		NA	
Surface Area Factor - Skin (mg-yr/kg-d)	SFSadj	361	7	253	7a	NA		NA		NA	

Exposure Factors: Reasonable Maximum Exposure

Parameter (unit)	Symbol	Residential		Urban Residential		Occupational		Construction Worker		Excavation Worker	
		Note		Note		Note		Note		Note	
SITE PARAMETERS											
Soil Bulk Density (g/cm ³)	ρ_b	1.70	8	=		=		=		=	
Soil Particle Density (g/cm ³)	ρ_s	2.74	9	=		=		=		=	
Soil Porosity	n	0.38	8	=		=		=		=	
Air Content - Vadose Zone Soils	n_a	0.26	10	=		=		=		=	
Air Content - Cap. Fringe Soils	$n_{a, \text{cap}}$	0.038	10	=		=		=		=	
Air Content - Foundation Cracks	$n_{a, \text{crk}}$	0.26	10	=		=		=		=	
Water Content - Vadose Zone Soils	n_w	0.12	8	=		=		=		=	
Water Content - Cap. Fringe Soils	$n_{w, \text{cap}}$	0.342	8	=		=		=		=	
Water Content - Foundation Cracks	$n_{w, \text{crk}}$	0.12	11	=		=		=		=	
Vadose Zone Thickness (cm)	L_v	605	12	=		=		=		=	
Capillary Fringe Thickness (cm)	L_{cap}	5.00	8	=		=		=		=	
Fraction Organic Carbon (shallow soil)	f_{oc}	0.005	8a	=		=		=		=	
Depth to Groundwater (cm)	L_w	610	8	=		=		=		=	
Groundwater Dilution-Attenuation Factor	DAF	946	19	=		=		=		=	
SOIL CONTAMINATION PARAMETERS											
Thickness of Contaminated Surface Soils (cm)	L_{ss}	0.0000001	8	=		=		=		=	
Fraction of Site with Surface Soil Contamination	f_{ss}	0.00	16	=		=		=		=	
Thickness of Clean Surface Soils (cm)	L_c	244	8	=		=		=		=	
Thickness of Subsurface Contamination (cm)	L_s	36	8	=		=		=		=	
Fraction of Site with Subsurface Vol. To Outdoor Air	f_{so}	0.21	17	=		=		=		=	
Thickness of Clean Soils Under Building (cm)	L_{cb}	280	8	=		=		=		=	
Thickness of Contaminated Soils Under Building (cm)	L_{sb}	0.0000001	8	=		=		=		=	
Fraction of Contaminated Soils Under Building	f_{sb}	0.00	18	=		=		=		=	
Particulate Emission Factor for Soils (kg/m ³)	PEF	7.58E-10	13	=		=		=		=	
BUILDING PARAMETERS											
Building Air Exchange Rate (1/day)	ER	24	14	=		48	14	NA		NA	
Building Height (indoor air mixing zone) (cm)	L_B	274	8	=		300	8	NA		NA	
Foundation Wall Thickness (cm)	L_{crk}	15	8	=		=		NA		NA	
Foundation Crack Fraction	f_{crk}	0.0010	15	=		=		NA		NA	

Exposure Factors: Reasonable Maximum Exposure

Parameter (unit)	Symbol	Residential		Urban Residential		Occupational		Construction Worker		Excavation Worker	
			Note		Note		Note		Note		Note
VOLATILIZATION FACTORS											
Averaging time for Volatilization -Adults (yr)	t_{vol}	25	16	=		=		=		=	
Averaging time for Volatilization -Children (yr)	t_{volc}	6	16	=		NA		NA		NA	
Max. Soil to Building Vol. Factor (kg/m^3)	VF_{sbmax}	2.83E-19	18	2.83E-19	18	1.29E-19	18	NA		NA	
Max. Surface Soil Vol. Factor - Adult (kg/m^3)	VF_{ssmax}	3.13E-21	16	3.13E-21	16	3.13E-21	16	3.13E-21	16	3.13E-21	16
Max. Surface Soil Vol. Factor - Child (kg/m^3)	VF_{scmax}	1.31E-20	16	=		NA		NA		NA	
Max. Soil to Outdoor Air Vol. Factor - Adult (kg/m^3)	VF_{soamax}	2.37E-06	17	2.37E-06	17	2.37E-06	17	NA		NA	
Volatile Organics Dispersion Term ($g/m^2 \cdot s$ per kg/m^3)	Q/C	6.88E+01	13	=		=		=		=	
MISCELLANEOUS PARAMETERS											
Ideal Gas Law Constant ($m^3 \cdot atm/K \cdot mol$)	R	8.21E-05	20	=		=		=		=	
Absolute Temperature (K)	T	2.93E+02	20	=		=		=		=	

Additional Information for Early Life-Stage Factor Calculations

Early Life-Stage Factors - Residential	Symbol	0 - 2 Years		3 - 6 Years		7 - 16 Years		17 - 30 Years		Total	
(See Note 22)			Note		Note		Note		Note		Note
Exposure Duration (yr)	ED	2		4		10		14		NA	
Body Weight (kg)	BW	15		15		70		70		NA	
Soil Ingestion Rate (mg/day)	IRs	200		200		100		100		NA	
Air Inhalation Rate (m^3/day)	IRa	10		10		20		20		NA	
Water Ingestion Rate (L/day)	IRw	1		1		2		2		NA	
Age-dependent Adjustment Factor	ADAF	10		3		3		1		NA	
Soil to Skin Adherence Factor (mg/cm^2)	AF	0.2		0.2		0.07		0.07		NA	
Skin Surface Area - Adult to Soil (cm^2)	SA	2800		2800		5700		5700		NA	
Inhalation Factor - Air ($m^3 \cdot yr/kg \cdot d$)	IFAadj	13.3		8.0		8.6		4.0		34	
Ingestion Factor - Soil ($mg \cdot yr/kg \cdot d$)	IFSadj	266.7		160.0		42.9		20.0		490	
Ingestion Factor - Water (L-yr/kg-d)	IFWadj	1.3		0.8		0.9		0.4		3.4	
Surface Area Factor - Skin ($mg \cdot yr/kg \cdot d$)	SFSadj	746.7		448.0		171.0		79.8		1445.5	

Additional Information for Early Life-Stage Factor Calculations

Early Life-Stage Factors - Urban Residential		Symbol	0 - 2 Years	3 - 6 Years	7 - 16 Years	NA	Total
(See Note 22)			Note	Note	Note	NA	Note
Exposure Duration (yr)	ED		2	4	10	NA	NA
Inhalation Factor - Air ($\text{m}^3\text{-yr/kg-d}$)	IFAadj		13.3	8.0	8.6	NA	30
Ingestion Factor - Soil (mg-yr/kg-d)	IFSadj		266.7	160.0	42.9	NA	470
Ingestion Factor - Water (L-yr/kg-d)	IFWadj		1.3	0.8	0.9	NA	3.0
Surface Area Factor - Skin (mg-yr/kg-d)	SFSadj		746.7	448.0	171.0	NA	1365.7
			Note	Note	Note	Note	Note
Early Life-Stage Factors - Vinyl Chloride Residential		Symbol	0 - 6 Years	0 - 6 Years	7 - 30 Years	7 - 70 Years	Total
(See Note 22)			Note	Note	Note	Note	Note
Exposure Duration (yr)	ED		6	6	24	64	NA
Inhalation Factor - Air ($\text{m}^3\text{-yr/kg-d}$)	IFAadj		3.3	3.3	6.9	18.3	32
Ingestion Factor - Soil (mg-yr/kg-d)	IFSadj		80.0	80.0	34.3	91.4	286
Ingestion Factor - Water (L-yr/kg-d)	IFWadj		0.6	0.6	0.7	1.8	3.7
Surface Area Factor - Skin (mg-yr/kg-d)	SFSadj		224.0	224.0	136.8	364.8	949.6
Early Life-Stage Factors - Vinyl Chloride Urban Residential		Symbol	0 - 6 Years	0 - 6 Years	7 - 11 Years	7 - 70 Years	Total
(See Note 22)			Note	Note	Note	Note	Note
Exposure Duration (yr)	ED		6	6	5	64	NA
Inhalation Factor - Air ($\text{m}^3\text{-yr/kg-d}$)	IFAadj		3.3	3.3	1.4	18.3	26
Ingestion Factor - Soil (mg-yr/kg-d)	IFSadj		80.0	80.0	7.1	91.4	259
Ingestion Factor - Water (L-yr/kg-d)	IFWadj		0.6	0.6	0.1	1.8	3.2
Surface Area Factor - Skin (mg-yr/kg-d)	SFSadj		224.0	224.0	28.5	364.8	841.3

For explanation of notes, please see "Notes to Accompany Risk-Based Concentrations for Individual Chemicals."

Risk-Based Concentrations for TPH: Site-Specific Data

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Fuel Fraction	RBCss					RBCso		
	Residential	Urban Residential	Occupational	Construction Worker	Excavation Worker	Residential	Urban Residential	Occupational
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aliphatic C5-C6	8.7E-03	8.7E-03	6.5E-03	8.7E-03	7.7E-04	4.3E-03	4.3E-03	1.1E-03
Aliphatic >C6-C8	9.3E-03	9.3E-03	6.9E-03	9.3E-03	8.2E-04	4.6E-03	4.6E-03	1.1E-03
Aliphatic >C8-C10	2.2E-01	2.2E-01	1.6E-01	2.2E-01	1.9E-02	1.5E-02	1.5E-02	3.7E-03
Aliphatic >C10-C12	7.2E-02	7.2E-02	5.4E-02	7.2E-02	6.4E-03	4.7E-04	4.7E-04	1.2E-04
Aliphatic >C12-C16	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aliphatic >C16-C21	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aliphatic >C21-C34	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aromatic >C8-C10	5.4E-01	5.4E-01	4.0E-01	5.4E-01	4.8E-02	7.2E-02	7.2E-02	1.8E-02
Aromatic >C10-C12	1.4E-01	1.4E-01	1.0E-01	1.4E-01	1.2E-02	1.9E-03	1.9E-03	4.7E-04
Aromatic >C12-C16	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aromatic >C16-C21	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aromatic >C21-C34	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
n-Hexane	5.2E-04	5.2E-04	3.9E-04	5.2E-04	4.6E-05	1.4E-02	1.4E-02	3.6E-03
Benzene	6.3E-10	6.3E-10	4.7E-10	6.3E-10	5.5E-11	1.4E-10	1.4E-10	3.6E-11
Toluene	3.1E-11	3.1E-11	2.3E-11	3.1E-11	2.8E-12	8.8E-13	8.8E-13	2.2E-13
Ethylbenzene	7.9E-04	7.9E-04	5.9E-04	7.9E-04	7.0E-05	8.3E-05	8.3E-05	2.1E-05
Total Xylenes	9.7E-04	9.7E-04	7.2E-04	9.7E-04	8.6E-05	1.9E-03	1.9E-03	4.7E-04
1,2,4-trimethylbenzene	5.0E-11	5.0E-11	3.7E-11	5.0E-11	4.4E-12	9.6E-11	9.6E-11	2.4E-11
1,3,5-trimethylbenzene	5.0E-11	5.0E-11	3.7E-11	5.0E-11	4.4E-12	1.1E-10	1.1E-10	2.9E-11
Naphthalene	1.5E-02	1.5E-02	1.1E-02	1.5E-02	1.4E-03	7.9E-04	7.9E-04	2.0E-04
TPH RBC* —▶	13,000	26,000	>MAX	51,000	>MAX	>MAX	>MAX	>MAX
Generic Gasoline	720	1,500	22,000	13,000	>MAX	4,500	4,500	80,000
Generic Diesel / Heating Oil	3,900	8,300	70,000	23,000	>MAX	>MAX	>MAX	>MAX
Generic Mineral Insulating Oil	9,800	20,000	>MAX	40,000	>MAX	>MAX	>MAX	>MAX

Risk-Based Concentrations for TPH:

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Fuel Fraction	RBCsi			RBCsw		
	Residential	Urban Residential	Occupational	Residential	Urban Residential	Occupational
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aliphatic C5-C6	5.1E-16	5.1E-16	5.8E-17	4.1E-04	4.1E-04	1.0E-04
Aliphatic >C6-C8	5.5E-16	5.5E-16	6.2E-17	5.3E-05	5.3E-05	1.3E-05
Aliphatic >C8-C10	4.3E-15	4.3E-15	4.9E-16	3.4E-05	3.4E-05	8.4E-06
Aliphatic >C10-C12	1.4E-15	1.4E-15	1.6E-16	7.2E-07	7.2E-07	1.8E-07
Aliphatic >C12-C16	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aliphatic >C16-C21	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aliphatic >C21-C34	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aromatic >C8-C10	2.1E-14	2.1E-14	2.4E-15	2.2E-02	2.2E-02	5.6E-03
Aromatic >C10-C12	5.3E-15	5.3E-15	6.1E-16	2.0E-03	2.0E-03	5.0E-04
Aromatic >C12-C16	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aromatic >C16-C21	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Aromatic >C21-C34	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
n-Hexane	1.7E-15	1.7E-15	1.9E-16	5.4E-04	5.4E-04	1.3E-04
Benzene	1.7E-23	1.7E-23	2.0E-24	8.2E-10	8.2E-10	2.1E-10
Toluene	1.1E-25	1.1E-25	1.2E-26	4.1E-12	4.1E-12	1.0E-12
Ethylbenzene	1.6E-17	1.6E-17	1.8E-18	6.1E-05	6.1E-05	1.5E-05
Total Xylenes	3.9E-16	3.9E-16	4.5E-17	1.0E-03	1.0E-03	2.5E-04
1,2,4-trimethylbenzene	8.7E-23	8.7E-23	9.9E-24	6.2E-11	6.2E-11	1.5E-11
1,3,5-trimethylbenzene	8.7E-23	8.7E-23	9.9E-24	5.5E-11	5.5E-11	1.4E-11
Naphthalene	2.1E-14	2.1E-14	2.4E-15	7.7E-03	7.7E-03	1.9E-03
TPH RBC* →	>MAX	>MAX	>MAX	>MAX	>MAX	>MAX
Generic Gasoline	140	140	>MAX	26	26	110
Generic Diesel / Heating Oil	>MAX	>MAX	>MAX	2,800	2,800	>MAX
Generic Mineral Insulating Oil	>MAX	>MAX	>MAX	>MAX	>MAX	>MAX

Risk-Based Concentrations for TPH:

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Fuel Fraction	RBC _{tw}			RBC _{wo}		
	Residential	Urban Residential	Occupational	Residential	Urban Residential	Occupational
	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Aliphatic C5-C6	3.5E+04	3.5E+04	1.4E+05	2.0E+06	2.0E+06	8.1E+06
Aliphatic >C6-C8	3.5E+04	3.5E+04	1.4E+05	1.3E+06	1.3E+06	5.4E+06
Aliphatic >C8-C10	1.4E+03	1.4E+03	5.5E+03	4.4E+04	4.4E+04	1.8E+05
Aliphatic >C10-C12	1.4E+03	1.4E+03	5.5E+03	2.9E+04	2.9E+04	1.2E+05
Aliphatic >C12-C16	3.7E+03	3.7E+03	1.5E+04	6.8E+03	6.8E+03	2.7E+04
Aliphatic >C16-C21	7.3E+04	7.3E+04	2.9E+05	4.8E+03	4.8E+03	1.9E+04
Aliphatic >C21-C34	7.3E+04	7.3E+04	2.9E+05	2.4E+02	2.4E+02	9.4E+02
Aromatic >C8-C10	3.4E+02	3.4E+02	1.3E+03	1.2E+06	1.2E+06	4.7E+06
Aromatic >C10-C12	3.4E+02	3.4E+02	1.3E+03	2.9E+06	2.9E+06	1.1E+07
Aromatic >C12-C16	3.4E+02	3.4E+02	1.3E+03	5.1E+06	5.1E+06	2.0E+07
Aromatic >C16-C21	1.8E+02	1.8E+02	7.3E+02	6.3E+06	6.3E+06	2.5E+07
Aromatic >C21-C34	1.1E+03	1.1E+03	4.4E+03	8.9E+07	8.9E+07	3.5E+08
n-Hexane	1.5E+03	1.5E+03	5.8E+03	2.3E+05	2.3E+05	9.3E+05
Benzene	4.4E+01	4.4E+01	1.8E+02	3.2E+05	3.2E+05	1.3E+06
Toluene	2.3E+03	2.3E+03	9.1E+03	4.9E+07	4.9E+07	1.9E+08
Ethylbenzene	1.3E+03	1.3E+03	5.4E+03	1.0E+07	1.0E+07	4.1E+07
Total Xylenes	2.1E+02	2.1E+02	8.2E+02	1.1E+06	1.1E+06	4.3E+06
1,2,4-trimethylbenzene	1.2E+01	1.2E+01	4.9E+01	7.7E+04	7.7E+04	3.1E+05
1,3,5-trimethylbenzene	1.2E+01	1.2E+01	4.9E+01	6.2E+04	6.2E+04	2.5E+05
Naphthalene	6.2E+00	6.2E+00	2.5E+01	2.1E+05	2.1E+05	8.4E+05
TPH RBC* →	740	740	3,000	>S	>S	>S
Generic Gasoline	100	100	400	>S	>S	>S
Generic Diesel / Heating Oil	88	88	350	>S	>S	>S
Generic Mineral Insulating Oil	290	290	1,100	>S	>S	>S

Risk-Based Concentrations for TPH:

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Fuel Fraction	RBCwi			RBCwe Construction & Excavation Worker	RBCair		
	Residential (ug/L)	Urban Residential (ug/L)	Occupational (ug/L)		Residential (ug/m ³)	Urban Residential (ug/m ³)	Occupational (ug/m ³)
Aliphatic C5-C6	1.2E+05	1.2E+05	1.0E+06	3.1E+06	2.1E+04	2.1E+04	8.3E+04
Aliphatic >C6-C8	7.6E+04	7.6E+04	6.7E+05	2.2E+06	2.1E+04	2.1E+04	8.3E+04
Aliphatic >C8-C10	2.5E+03	2.5E+03	2.2E+04	2.0E+04	1.1E+03	1.1E+03	4.4E+03
Aliphatic >C10-C12	1.7E+03	1.7E+03	1.5E+04	6.7E+03	1.1E+03	1.1E+03	4.4E+03
Aliphatic >C12-C16	3.8E+02	3.8E+02	3.4E+03	1.2E+03	1.1E+03	1.1E+03	4.4E+03
Aliphatic >C16-C21	2.7E+02	2.7E+02	2.4E+03	1.6E+03	7.3E+03	7.3E+03	2.9E+04
Aliphatic >C21-C34	1.3E+01	1.3E+01	1.2E+02	6.0E+02	7.3E+03	7.3E+03	2.9E+04
Aromatic >C8-C10	8.0E+04	8.0E+04	7.0E+05	2.7E+04	2.2E+02	2.2E+02	8.8E+02
Aromatic >C10-C12	2.6E+05	2.6E+05	2.3E+06	2.4E+04	2.2E+02	2.2E+02	8.8E+02
Aromatic >C12-C16	6.6E+05	6.6E+05	5.8E+06	2.0E+04	2.2E+02	2.2E+02	8.8E+02
Aromatic >C16-C21	1.3E+06	1.3E+06	1.1E+07	9.5E+03	1.1E+02	1.1E+02	4.4E+02
Aromatic >C21-C34	2.5E+07	2.5E+07	2.2E+08	5.5E+03	1.1E+02	1.1E+02	4.4E+02
n-Hexane	1.3E+04	1.3E+04	1.2E+05	1.6E+05	7.3E+02	7.3E+02	2.9E+03
Benzene	2.6E+04	2.6E+04	2.3E+05	5.5E+03	3.1E+01	3.1E+01	1.3E+02
Toluene	3.7E+06	3.7E+06	3.2E+07	2.0E+05	5.1E+03	5.1E+03	2.0E+04
Ethylbenzene	7.4E+05	7.4E+05	6.5E+06	1.1E+05	1.1E+03	1.1E+03	4.2E+03
Total Xylenes	8.3E+04	8.3E+04	7.3E+05	2.2E+04	1.1E+02	1.1E+02	4.2E+02
1,2,4-trimethylbenzene	6.0E+03	6.0E+03	5.2E+04	1.3E+03	6.2E+00	6.2E+00	2.5E+01
1,3,5-trimethylbenzene	4.5E+03	4.5E+03	3.9E+04	1.4E+03	6.2E+00	6.2E+00	2.5E+01
Naphthalene	4.1E+04	4.1E+04	3.6E+05	6.8E+02	3.1E+00	3.1E+00	1.3E+01
TPH RBC* →	>S	>S	>S	>S	11,000	11,000	43,000
Generic Gasoline	>S	>S	>S	12,000	650	650	2,600
Generic Diesel / Heating Oil	>S	>S	>S	>S	120	120	490
Generic Mineral Insulating Oil	>S	>S	>S	>S	490	490	2,000

Exposure Factors

Reasonable Maximum Exposure

Page 1

Parameter (unit)	Symbol	Residential	Urban Residential	Occupational	Construction Worker	Excavation Worker
ACCEPTABLE RISK LEVELS						
Acceptable Risk Level - Carcinogens	ARLc	1.00E-06	=	=	=	=
Acceptable Risk Level - Noncarcinogens	ARLn	1	=	=	=	=
EXPOSURE PARAMETERS						
Averaging Time - Carcinogen (yr)	ATc	70	=	=	=	=
Averaging Time - Noncarcinogen (yr)	ATn	30	11	25	1	1
Averaging Time - Noncarcinogen, Child (yr)	ATnc	6	6	NA	NA	NA
Body Weight - Adult (kg)	BWa	70	=	=	=	=
Body Weight - Child (kg)	BWc	15	=	NA	NA	NA
Exposure Duration - Adult (yr)	ED	30	11	25	1	1
Exposure Duration - Child (yr)	EDc	6	6	NA	NA	NA
Exposure Frequency (day/yr)	EF	350	175	250	250	9
Event Frequency - Groundwater (events/day)	EvFwe	NA	NA	NA	2	=
Event Time - Groundwater (hr/event)	t _{event}	NA	NA	NA	2	=
Inhalation Rate - Adult (m ³ /day)	IRA	20	20	7	7	7
Inhalation Rate - Child (m ³ /day)	IRAc	8.3	=	NA	NA	NA
Soil Ingestion Rate - Adult (mg/day)	IRS	100	100	100	330	330
Soil Ingestion Rate - Child (mg/day)	IRSc	200	200	NA	NA	NA
Water Ingestion Rate - Adult (L/day)	IRW	2.0	2.0	0.7	NA	NA
Water Ingestion Rate - Child (L/day)	IRWc	1.5	=	NA	NA	NA
Skin Surface Area - Adult to Soil (cm ²)	SA	5700	5700	3300	3300	3300
Skin Surface Area - Child to Soil (cm ²)	SAC	2800	=	NA	NA	NA
Skin Surface Area - Adult to Groundwater (cm ²)	SAw	NA	NA	NA	5700	5700
Soil to Skin Adherence Factor - Adult (mg/cm ² -day)	AF	0.07	0.07	0.10	0.30	0.30
Soil to Skin Adherence Factor - Child (mg/cm ² -day)	AFc	0.20	=	NA	NA	NA
AGE-ADJUSTED EXPOSURE FACTORS						
Inhalation Factor - Air (m ³ -yr/kg-d)	IFAadj	10.18	4.75	NA	NA	NA
Ingestion Factor - Soil (mg-yr/kg-d)	IFSadj	114	87	NA	NA	NA
Ingestion Factor - Water (L-yr/kg-d)	IFWadj	1.29	0.74	NA	NA	NA
Surface Area Factor - Skin (mg-yr/kg-d)	SFSadj	361	253	NA	NA	NA

Exposure Factors

Reasonable Maximum Exposure

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Parameter (unit)	Symbol	Residential	Urban Residential	Occupational	Construction Worker	Excavation Worker
ACCEPTABLE RISK LEVELS						
Acceptable Risk Level - Carcinogens	ARLc	1.00E-06	=	=	=	=
SITE PARAMETERS						
Soil Bulk Density (g/cm ³)	ρ_b	1.70	=	=	=	=
Soil Particle Density (g/cm ³)	ρ_s	2.74	=	=	=	=
Soil Porosity	n	0.38	=	=	=	=
Air Content - Vadose Zone Soils	n_a	0.03	=	=	=	=
Air Content - Cap. Fringe Soils	n_{acap}	0.038	=	=	=	=
Air Content - Foundation Cracks	n_{acrk}	0.26	=	=	=	=
Water Content - Vadose Zone Soils	n_w	0.12	=	=	=	=
Water Content - Cap. Fringe Soils	n_{wcap}	0.342	=	=	=	=
Water Content - Foundation Cracks	n_{work}	0.12	=	=	=	=
NAPL Content - Vadose Zone Soils	n_p	0.230	=	=	=	=
Vadose Zone Thickness (cm)	L_v	605	=	=	=	=
Capillary Fringe Thickness (cm)	L_{cap}	5	=	=	=	=
Fraction Organic Carbon (shallow soil)	f_{oc}	0.005	=	=	=	=
Depth to Groundwater (cm)	L_w	610	=	=	=	=
Groundwater Dilution-Attenuation Factor	DAF	946	=	=	=	=
SOIL CONTAMINATION PARAMETERS						
Thickness of Contaminated Surface Soils (cm)	L_{ss}	0.0000001	=	=	=	=
Fraction of Site with Surface Soil Contamination	f_{ss}	0.00	=	=	=	=
Thickness of Clean Surface Soils (cm)	L_c	244	=	=	=	=
Thickness of Subsurface Contamination (cm)	L_s	36	=	=	=	=
Fraction of Site with Subsurface Vol. To Outdoor Air	f_{so}	0.21	=	=	=	=
Thickness of Clean Soils Under Building (cm)	L_{cb}	280	=	=	=	=
Thickness of Contaminated Soils Under Building (cm)	L_{sb}	0.0000001	=	=	=	=
Fraction of Contaminated Soils Under Building	f_{sb}	0.00	=	=	=	=
Particulate Emission Factor for Soils (kg/m ³)	PEF	7.58E-10	=	=	=	=

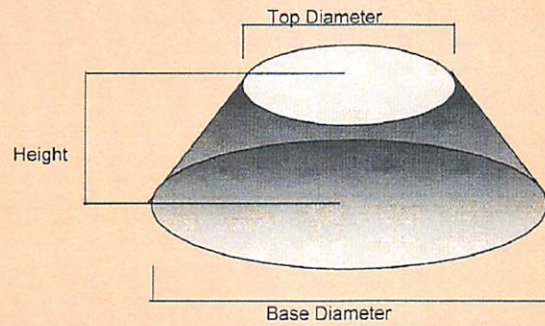
Exposure Factors

Reasonable Maximum Exposure

Page 3

Parameter (unit)	Symbol	Residential	Urban Residential	Occupational	Construction Worker	Excavation Worker
ACCEPTABLE RISK LEVELS						
Acceptable Risk Level - Carcinogens	ARLc	1.00E-06	=	=	=	=
BUILDING PARAMETERS						
Building Air Exchange Rate (1/day)	ER	24	=	48	NA	NA
Building Height (indoor air mixing zone) (cm)	L _B	274	=	300	NA	NA
Foundation Wall Thickness (cm)	L _{crk}	15	=	=	NA	NA
Foundation Crack Fraction	f _{crk}	0.001	=	=	NA	NA
VOLATILIZATION FACTORS						
Averaging time for Volatilization - Adults (yr)	t _{vol}	25	=	=	=	=
Averaging time for Volatilization - Children (yr)	t _{volc}	6	=	NA	NA	NA
Max. Soil to Building Vol. Factor (kg/m ³)	VF _{sb} max	2.83E-19	2.83E-19	1.29E-19	NA	NA
Max. Surface Soil Vol. Factor - Adult (kg/m ³)	VF _{ss} max	3.13E-21	3.13E-21	3.13E-21	3.13E-21	3.13E-21
Max. Surface Soil Vol. Factor - Child (kg/m ³)	VF _{ss} max	1.31E-20	=	NA	NA	NA
Max. Soil to Outdoor Air Vol. Factor - Adult (kg/m ³)	VF _{so} max	2.37E-06	2.37E-06	2.37E-06	NA	NA
Air Dispersion Term (g/m ² -s per kg/m ³)	Q/C	6.88E+01	=	=	=	=
MISCELLANEOUS PARAMETERS						
Ideal gas law constant (m ³ -atm/K-mol)	R	0.0000821	=	=	=	=
Temperature (Kelvins)	T	293	=	=	=	=

Volume of a Truncated Cone



ENTER	
Top Diameter	16.0
Base Diameter	26.0
Height	1.2

$(\pi/12) \times \text{Height}$	0.3 (a)
Base Diameter squared	676.0 (b)
Base Diameter * Top Diameter	416.0 (c)
Top Diameter squared	256.0 (d)

$$\text{Volume} = a * (b+c+d)$$

Answer	
423	cubic feet
16	cubic yards

Disclaimer

Information in this environmental report and/or the environmental work performed for you was done so in accordance with accepted industry and regulatory standards. Because of uncertainties which are frequent in any environmental work, Universal Applicators, Inc. does not make any representations beyond those contained in this report.

Universal Applicators, Inc.

License	Number	Expiration
State of Oregon Contractor's Board No.	65928	04/17/2009
State of Washington Contractor's Registration No.	UNIVEAI087J11	04/10/2008
Oregon DEQ UST Cleanup Service Provider No.	12630	04/13/2008
Oregon DEQ Soil Matrix Service Provider No.	12631	04/13/2008
Oregon DEQ Heating Oil Tank Service Provider No.	16488	03/15/2008

Greg J. Brennan, Company President / UST Cleanup Supervisor

DEQ- Licensed Services	Number	Expiration
HOT Supervisor Services	17785	10/26/2009
Soil Matrix Cleanup	13312	10/26/2009
Installation/Retrofit	10436	09/14/2009
Decommissioning	10437	09/14/2009
Cathodic Protection	10438	09/14/2009

R. Greg Babcock, Company Treasurer / UST Cleanup Supervisor

DEQ- Licensed Services	Number	Expiration
HOT Supervisor Services	17746	08/29/2009

Robert A. Fisher, UST Cleanup Supervisor

DEQ- Licensed Services	Number	Expiration
Installation/Retrofit	12184	02/18/2009
Cathodic Protection	12183	02/18/2009
Decommissioning	13317	01/23/2010
Tightness Testing	13318	01/23/2010
Soil Matrix Cleanup	13319	01/23/2010
HOT Supervisor Services	17784	07/15/2008
Registered Site Assessor, WA	1036124-U7	10/14/2008

Sheldon G. Peck, UST Cleanup Supervisor

DEQ- Licensed Services	Number	Expiration
HOT Supervisor Services	18413	02/15/2009
Soil Matrix Cleanup	15696	01/29/2009

Norman Engen, UST Cleanup Supervisor

DEQ-Licensed Services	Number	Expiration
HOT Supervisor Services	25172	10/30/2008

Jesse Keyes, UST Cleanup Supervisor

DEQ-Licensed Services	Number	Expiration
HOT Supervisor Services	25914	04/29/2009