

Government of the District of Columbia



**DISTRICT OF COLUMBIA
REMEDIAL ACTION STRATEGY
STATEMENT OF BASIS**

**Chevron Gasoline Release
at Chillum, Maryland**

**Ward-4
Riggs Park Community
Environmental and Health Impact
Washington, D.C.**

September 7, 2007

GLOSSARY

ATSDR - The Agency for Toxic Substances and Disease Registry

BTEX - Benzene, toluene, ethyl benzene, and xylenes

COC – Contaminants of Concern

DOH – District of Columbia Department of Health

EPA- U.S. Environmental Protection Agency

FDRTC - Final Decision Document and Response to Comments

MCL - Maximum Contaminant Levels

MDE - Maryland Department of Environment

MTBE - Methyl tertiary-butyl ether

OSHA - Occupational Safety and Health Administration

ppb – Parts per billion

RBC – Risk Based Concentrations

RCRA – Resource Conservation and Recovery Act

FDRTC - Final Decision Document and Response to Comments

SB – Statement of Basis

UAO – EPA Unilateral Administrative Order

ug/l – Micro grams per liter

UST – Underground Storage Tank

VOC - Volatile organic compounds

RBCA-D.C. Risk Based Corrective Action

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I. INTRODUCTION

This Remedial Statement of Basis explains the District of Columbia's proposed remedy for the gasoline release originating from the gas station formerly owned by Chevron U.S.A. Inc. (Chevron) and located at 5801 Riggs Road in Chillum, Prince George's County, Maryland (the Facility) under the Title 20 DCMR Chapters 55 thru 77. The remedy was identified after reviewing the EPA Statement of Basis (dated August 30, 2007) and extensive groundwater, soil vapor, and indoor air sampling data generated by the District of Columbia, EPA, and Chevron. The District is proposing as the remedy the expansion of the existing groundwater remediation system at the Maryland facility to stop the impact on the District's properties, installation of a remediation system in the District of Columbia to remediate the contamination present underneath District properties, the installation of vapor mitigation systems in homes impacted by subsurface vapor intrusion, and the implementation of monitoring controls.

The purpose of this document is not to duplicate any federal requirements. Further, it is not appropriate to compare the District of Columbia to Maryland and Virginia, since the District is a completely urban setting. The District's environmental laws and regulations are generally in line with the federal environmental laws and regulations adopted by the US Congress and the Environmental Protection Agency. The District of Columbia (and other states') environmental laws and regulations are required to be "at least as stringent as" the federal laws and regulations in order for the District (or a state) to be granted "state authorization" or "state program approval" to implement its program in lieu of the federal program. The District and other states are always allowed to have requirements which are "more stringent than" or "broader in scope" than those of the federal government. In fact, this is contemplated by many of the federal regulatory programs.

The Riggs Park Environmental and Health Committee have participated in the proposed remedy selection process by reviewing this RSB and submitting this to EPA to include it as part of EPA's SB during the public comment period. Upon EPA addressing all significant comments submitted in response to the proposed remedy, EPA will make a final remedy decision in consultation with the District and issue a Final Decision and Response to Comments after it considers information submitted during the public comment period.

II. FACILITY BACKGROUND

The Facility is located at the eastern corner of the intersection of Eastern Avenue and Riggs Road in Chillum, Maryland. The north side of the right-of-way of Eastern Avenue delineates the boundary between Prince George's County, Maryland and the District. The southern extent of the Facility property abuts the District.

In 2001, Chevron discovered that the gasoline contaminated groundwater (plume) had migrated into the District affecting a residential neighborhood known as Riggs Park. Because the plume impacts two separate political jurisdictions (the State of Maryland and the District), at the request of District Councilmember Adrian Fenty, who was later elected as Mayor of the District, EPA assumed the lead investigatory role for the Facility. The understanding based on several meetings was to use the District's standards for the District side of the investigation and the remediation, and Maryland levels for Maryland side of the contaminants.

III. SUMMARY OF GASOLINE RELEASE INVESTIGATION

Chevron has collected soil, soil vapor, indoor air and groundwater samples, under the supervision of EPA, and has conducted pilot tests to upgrade the existing groundwater remediation system. Between 2001 and 2007, Chevron installed 232 temporary Geoprobe wells, 80 groundwater-monitoring wells, 7 product recovery wells, and 4 soil vapor monitoring wells. Cumulatively, during the same period, Chevron has collected over 3000 groundwater samples, 300 soil samples, 250 soil vapor samples from 90 properties, 50 indoor and ambient air samples from 20 properties, and 14 basement sump samples.

Between 2002 and 2005, EPA's Superfund Removal program collected indoor air samples from 32 properties and installed 24 soil vapor wells for its PERC investigation; and the U.S. Army Corps of Engineer (ACE), on behalf of EPA, generated split /quality control data from over half the properties sampled by Chevron. As per the communities request and the council, in 2006, DOH initiated an independent indoor air sampling effort, based on voluntary participation by the Riggs Park residents. During that investigation, DOH collected indoor air data from 97 homes in Riggs Park bounded geographically by four streets: Kennedy Street, Madison Street, Eastern Avenue, and Riggs Road. While EPA's proposed remedy does not address the DOH or PERC investigation, EPA has relied on data collected by both investigations to support its proposed remedy for the Facility. In 2007, DOH initiated winter sampling of Category I homes and their co-slabs as identified in the previous DOH investigation.

Based on soil, soil vapor, indoor air, and groundwater data collected through May-June 2004, EPA has delineated a shallow benzene plume and a shallow methyl tertiary-butyl ether (MTBE) plume as shown in Figures 2 and 3. The shallow benzene plume extends approximately 700 feet from the Facility into the District, and the shallow MTBE plume is about twice as long, extending about 1400 feet from the Facility into the District. The combined maximum boundary of both plumes are referred here as the gasoline plume. However, verification of results submitted by Chevron for March 2006, September 2006 and March 2007 indicate significant increase in size of the gasoline plume. DOH has delineated benzene plume and MTBE plume as shown in Figure 4 and 5.

The District has characterized the indoor air data collected from 97 homes by DOH, Soil Vapor test results completed by EPA and Chevron. The data indicate that there is elevated benzene and MTBE vapor concentrations in homes, suggesting that there is likelihood of soil vapor intrusion. Based on review of indoor air samples collected by EPA, Chevron, and DOH, the District has identified up to 53 homes where measured vapor concentrations have far exceeded the Cancer Risk Evaluation as indicated above that are estimated contaminant concentrations that would be expected to cause no more than one excess cancer in a million persons exposed over a lifetime. These are calculated from EPA's cancer potency factors. The District has listed the remediation standards for groundwater and soil, however, the listed indoor air and soil vapor concentrations representing one-in-a million are extracted from EPA documents and presented in Section VI, below. The District has also characterized the outdoor ambient air data collected by Chevron, DOH, and ACE. Outdoor benzene concentrations are at levels below to that of measured indoor air concentrations. This suggests soil vapor intrusion as well.

IV. HEALTH AFFECTS

The primary health concern for the Department of Health is that vapor can volatilize from the contaminated soil, aqueous gasoline plume, and groundwater in the form of soil gas and migrate into the basements of homes through cracks, joints and utilities openings, and front and back yards gardening and playing areas. This effect is referred to here as Soil Vapor intrusion. Subsurface vapor intrusion can impact those homes located above such subsurface zones. DOH's indoor air sampling differs from Chevron's approach because DOH relied upon direct measurement and impact of vapor intrusion on the indoor air and the cancer risk evaluation based on the adequate protection of human health in accordance with maximum tolerable human health risks. This includes acute, chronic, and cancer risk evaluation based on one-in-a million criteria for residents within designated impacted geographic boundaries which correlate with the whole down gradient assessment boundaries. Acute levels and chronic levels were used as the guide for immediate removal and to determine moderate risks. For the remedial action plans in the District of Columbia, the standard of one-in-a million cancer risk must be used. The Center for Policy, Planning & Epidemiology of the District of Columbia Department of Health has determined that exposure to high levels of volatile compounds, like benzene and MTBE increases the risk of various adverse health outcomes, and DOH wants to ensure that this risk is minimized. In this regard, DOH accepts that exposure to contaminated air at the levels determined in separate EPA and DOH assessments is not expected to cause any adverse health effects, if remediation procedures are followed based on the standard of one-in-a-million cancer risk, as indicated above.

V. INTERIM MEASURES

In 1990, under MDE oversight, Chevron installed and began operating a skimmer system at the Facility to recover gasoline product from the groundwater. In 1994, the system was modified into a dual phase extraction system to recover gasoline product from both groundwater and soil vapor. To aggressively recover the additional gasoline product, a source system upgrade was done in early 2005. This upgraded groundwater remediation system is currently pumping about 20 gallons per minute, versus about 2 gallons per minute the old system was pumping before the upgrade. As of March 2007, the system has recovered 4,800 gallons of gasoline product cumulatively since the beginning of its operation in 1990. For more than 10 years until early 2005, the system recovery was less than 2500 gallons of gasoline product. Upon the District's initiative, in the past two years after system upgrade, nearly 2500 gallons has been recovered stopping additional migration into District properties. During this interim remedial measure, sufficient recovery wells and an adequate capture zone have not yet been established to reduce the contaminant migration into the District. DOH is afraid that the plume is expanding on the western side of clay layer based on Chevron's semi annual monitoring well sampling results collected during District's oversight. Source has been spread to District side due to inadequate capture of contaminated plume. Chevron submits these results to EPA as per their order.

VI. SCOPE OF REMEDIATION AND STRATEGY

Although, Chevron proposes to expand the existing groundwater remediation system and install vapor mitigation systems in five homes impacted by subsurface soil vapor intrusion, this will only minimize the further migration of contaminants from the facility and the vapor mitigation of 5 homes. However, the contamination already present in the soil and groundwater and the soil gas underneath all impacted homes has to be recovered and treated to the regulatory standards. Chevron's expectation that the plume will be self-cleaning due to biodegradation of dissolved phase

hydrocarbons (benzene, toluene, ethyl benzene, xylenes, MTBE, total petroleum hydrocarbon-gasoline range) is not acceptable to the District due to the plume's location (in an existing residential area) and its size (longest gasoline plume of 1400 feet in the history of the District of Columbia). Evaluation of the sample results for the last year and a half, after the remediation startup in 2005, indicates that the Benzene and MTBE Plumes have extended on the west side of the clay layer reaching Nicholson Street. Now a 700 feet benzene plume, as identified before, would mean more than an estimated 1400 feet in both length and width and an increase in volume. The plume has increased by an estimated 700 feet. Similarly, now the MTBE plume has increased to the other side of the clay layer resulting in an estimated benzene and MTBE plume of equal length and widths. This can be addressed in Three prong approach:

A. Free product Removal, Groundwater and Vapor Extraction Remediation Strategy

1. Product Removal at Facility: Remove all liquid phase hydrocarbons (gasoline product sources) that are continually present at the parking lot and on the Facility. Evaluate for installing additional active product skimmers.
2. Stopping Petroleum Migration to DC side: Upgrade or expand the existing groundwater remediation system in Area A as mentioned in EPA Statement of Basis by installing angle recovery wells up to the boundaries of private properties to stop the imminent migration of source from the facility. Inadequate recovery resulted in persistent unacceptable levels of elevated contamination in DC well numbers 16, 17, 18, 22, 23, and 25, resulting in a potential source for plume expansion. Proposed inclined wells will enhance the removal of petroleum product entering into the residential Area B not addressed in 2005 system upgrades. However, the design of two recovery wells will not address the capture of gasoline plume on the District side.
3. Removing Free Product, Treating Groundwater and Soil Vapor Extraction on DC side: The District understands that it is highly infeasible and not practical to install 20 to 30 additional conventional recovery wells across the residential properties that then connect back to the existing recovery system. The plume not addressed before cannot be remediated by installing two inclined wells at Eastern Avenue. Therefore, an Independent Dual Phase Groundwater Recovery and Soil Vapor Extraction Treatment System installed in the Riggs Park community with conventional recovery wells on the DC side connected to an independent treatment system is warranted. The capture zone will be designed to recover the contaminants from the plume which was never addressed before.

Please refer to the following results as immediate reference and to plot on the existing EPA plume map dated 2004:

DC Side Groundwater Wells Impacts (in ppb)									
GW Well #	BENZENE (5ppb) Action level 5 ppb			MTBE (20 ppb) Action level 20ppb			TPH-GRO (<1000ppb) Guidance 1000ppb		
	Mar-06	Oct-06	Mar-07	Mar-06	Oct-06	Mar-07	Mar-06	Oct-06	Mar-07

Eastern Avenue Section, GW depths 26 feet to 44 feet									
16	24.4	1600	2200	1970	2500	2400	2210	18000	32000
17	1620	5100	360	3030	6500	750	31400	18000	6200
18	1.6	<5	<20	1709	<5	<20	4320	4900	25000
22	6860	7900	2400	2020	1100	570	85200	110000	54000
23	1	1.2	2	31.3	20	38	152	<100	<100
24	864	540	5.6	4	<50	1	60100	80000	48000
25	403	470	320	461	550	370	1630	1300	1300

OGLETHORPE STREET Section -Not enough wells (Interpolate data) GW depths 15 to 22 ft.

Nicholson Street Section, GW depths 4.1 feet to 13 feet									
26	144	100	140	221	210	270	484	320	320
43	309	3	5	29.6	24	30	<100	<100	<100
44	1	1	1	143	120	140	159	<100	<100
27	168	150	200	451	370	530	706	970	720
33	974	760	670	653	520	400	2820	2000	1200
53	4	54	15	103	240	110	116	250	110

DOH does recommend this alternative because of the concern that the present recovery system has not pulled the gasoline plume from the District side further into Maryland. It appears from recent data on the District side, although the system in Maryland is working, the plume on the District side is expanding when compared with EPA’s plume declaration in the Statement of Basis presented for public comments on August 30, 2007. This system must be dual phase with the soil vapor extraction capability while treating the groundwater. There may be numerous implementation obstacles to overcome such as acquiring private property for the placement of the treatment building, securing a separate power source, installing recovery wells and underground piping to private properties and tie them into the treatment system and discharge to the storm sewer. Additional challenges include the noise, esthetic concerns, emission and traffic interference during construction, and long-term operation of the system in a residential neighborhood. These can be controlled by environmental regulatory oversight. But, the future protection of human health, the environment, and the safety of the public living on Eastern Avenue, Oglethorpe, Nicholson and 8th Street is important to the District of Columbia Department of Health.

B. Home Vapor Mitigation Strategy

Homes located above the overall gasoline contamination are vulnerable to subsurface vapor intrusion. The District’s guidance to evaluate the inhalation of these toxic vapors is based on one in a million cancer risk as per DCMR to develop removal action levels for remediation or refer to the EPA soil vapor guidance document and extract remedial action levels based on one-in-a million. Scientific equations are in several District and Federal documents. The number of impacted homes

based on one in a million can be determined. Presently, the District estimates 53 homes based on the DOH studies. The District proposes to have Chevron install a subslab depressurization system commonly used in radon mitigation to prevent vapor entry into residential basements impacted by the gasoline contamination. The depressurization system operates by creating a slight vacuum beneath the subslab that draws a slow stream of air through the subslab venting pipes, thereby reversing the vapor movement gradient and direction. As a vapor mitigation strategy, identify the number of homes above the one in a million conservative cancer risk evaluation comparison values, which DOH believes is safe for indoor inhalation, and design the vapor abatement system with a rigorous monitoring plan that protects from any vapor leaks or fire hazards.

C. Indoor Air and Soil Vapor Monitoring and Sampling Strategy

Inhalation of volatile organic carbon poses an incremental involuntary risk. Until complete remediation of subsurface contamination on the Maryland and District side, Chevron must monitor indoor air quality on a quarterly basis. On a semi-annual basis Chevron must sample for indoor air and the soil vapor for all the houses located on the contaminated plume. This can be accomplished during semi annual sampling of groundwater wells. All data included in the Home Test Report must be validated and include a professional opinion as to the source of the contaminants and remediation recommendations, if needed, and provision to the homeowners. Adequate permanent soil vapor ports on the residential properties do not exist on site.

VII. REMEDIATION STANDARDS

The contaminants of concern (COC) relating to the Facility are benzene, toluene, ethylbenzene, xylenes (BTEX) and MTBE. These COCs are present in groundwater, soil and soil vapor within the gasoline contamination zone.

A. Groundwater Remediation Standards

District and EPA have promulgated groundwater cleanup levels to meet drinking water standards established by the Maximum Contaminant Levels (MCLs) promulgated at 40 C.F.R. Part 141 pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300g-1, except for MTBE. MTBE does not have a MCL in either of the regulations. However, in 2002, DOH provided a conservative cleanup standard adopted by several states in the region and EPA as proposed remediation standard for MTBE based on taste and odor thresholds. EPA accepted the standard as adopted by the District. Proposed groundwater remediation standards are as follows:

Benzene	5 µg/l (micrograms per liter)
Toluene	1,000 µg/l
Ethylbenzne	700 µg/l
Xylenes	10,000 µg/l
MTBE	20 µg/l

B. Soil Remediation Standards:

District has developed soil cleanup levels and EPA has accepted these action levels in 2002. These levels are based on 10^{-6}

Benzene	0.157 mg/kg (milligrams per kilogram)
Toluene	125 mg/kg
Ethylbenzene	1160 mg/kg
Xylenes	504 mg/kg
MTBE	1440 mg/kg
TPH	100 mg/kg

C. Indoor Air Targeted Action Level and Soil Vapor Targeted Action Level

DOH has been working very closely with EPA and the Maryland Department of the Environment (MDE) over the past six and half years in communicating the community's concerns about the potential risk due to former release from the facility located in the State of Maryland and impacting the District of Columbia. Because of concerns raised by the public and the Council, DOH contracted with an independent vendor to conduct an indoor and ambient air study in the Riggs Park Community. During this contract, for screening purposes, indoor action levels were developed for Benzene, which is a carcinogen, by using the model equations. This was $0.8 \mu\text{g}/\text{m}^3$ based on 1 in a million cancer risk. The action level for the four other contaminants was the same as that of EPA's removal action level for this site. The former Senior Deputy Director of EHA and Attorney, DOH communications, DOH contractor, Deputy Chief of Hazardous Materials and Toxic Substances, the Air Quality Division Program Manager, UST and LUST technical staffs contributed to the development of the benzene screening indoor air action level document. Indoor air direct sampling measurements were captured by the DOH contractor. The contractor conducted pre sampling interviews of the occupants, screening of the building to identify unintended cracks and openings in the lower level of the home, and screening for consumer products. The benzene action level described above was the benzene screening level for this contract for this site. This site did not meet the criteria to be apart of the Risk Based Corrective Action Program due to the presence of free product on the site, therefore the District could not apply the Tier 2 or Tier 3 target indoor action levels. Therefore, as per the requirements, screening levels will become the only clean-up levels.

Therefore, the following model equation used in the calculation for indoor air action screening level for Benzene:

$$\frac{\text{TR} \times \text{BW} \times \text{ATc} \times 365}{\text{IR}_{\text{ai}} \times \text{ET}_{\text{in}} \times \text{ED} \times \text{EF} \times \text{SF}_i}$$

$$\frac{10^{-6} \times 15 \times 70 \times 365 \times 1000}{0.417 \times 18 \times 6 \times 350 \times 0.029} = 0.838 \mu\text{g}/\text{m}^3$$

For Resident Child = $\sim 0.80 \mu\text{g}/\text{m}^3$

Description	Variables	Res. Child	Res. adult	Com. Worker	Cons. Worker
Target Risk	TR	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Body Weight	BW	15	70	70	70
Averaging Time For Carcinogens	Atc	70	70	70	70
Exposure Frequency	EF	350	350	250	90
Exposure Duration	ED	6	30	25	1
Averaging Time For Carcinogens	AT _{nc}	6	30	25	1
Hourly indoor inhalation rate	IR _{in} ***	0.417	0.633	1.5	1.5
Exposure time for indoor inhalation	***ET _{in} *	18	18	10	10
Exposure time for outdoor inhalation	Etout	10	10	10	10
Target Hazard Quotient	THQ	1	1	1	1
Indoor inhalation Rate	IR _{ai}	0.417	0.633	1.5	1.5
Slope Factor inhalation	Sfi	0.029	0.029	0.029	0.029

The computations are per the District's Underground Storage Management Act and the regulations that dictate the maximum tolerable human health risk for carcinogens shall be one-in -a-million Vs EPA's action levels one in ten thousand to one in a million as per superfund guidelines. Please note, action levels vary from site to site based upon the identified target population at risk, i.e., adults, children, both, and what published exposure inputs used to arrive at the calculated action levels to include breathing rate, exposure, duration, exposure time, body weight etc. The action levels for soil remediation have been calculated similarly and submitted to EPA. In 2002, EPA accepted the District's soil remediation action levels as calculated. These action levels are calculated using the same model equations.

The background outdoor ambient air concentrations were measured to be between 0.4 to 0.9 ug/m³. Since the indoor air concentration due to vapor intrusion from the subsurface exceeds the indoor air screening level as calculated above, a specific remedial plan for each case must be devised. However, the above screening level does not imply that outdoor air concentrations are unacceptable and need to be mitigated. DOH considered both the background concentrations of BTEX constituents and MTBE and the acceptable risk ranges for those contaminants in establishing the above remediation standards. According to the District's remediation guidelines, the acceptable risk range for cancer protection is one in 1,000,000, and for non-cancer protection is a Hazard Quotient equaling one. Benzene is a known human carcinogen. The carcinogenic status of MTBE has not been established by EPA, however, EPA Region III conservatively treats MTBE as a possible carcinogen and the District has adopted is treatment. All other petroleum compounds of concern, toluene, ethylbenzene and xylenes, are not considered to be carcinogenic. The District understands that the removal of soil vapors present in indoor air to concentrations below the background ambient air level is difficult to achieve.

EPA has developed the Indoor Air Soil Vapor Remediation standards of one in 100,000. EPA selected 8 µg/m³ and 17 µg/m³, as the remediation standards for benzene and MTBE, respectively. Lifetime excess cancer risks associated with the selected standards are estimated to be in one in 100,000 and are within the EPA acceptable risk range of one in 10,000 thru 1 in 1,000,000. However, for the presence of multiple contaminants at a site, 40 CFR Ch.1 Page 70 section 300.430

e)(2)(i)A) suggests the use of one in a million. Accordingly, the District converted this to one in a million and the following would be the remediation standards, which are in line with the District's Screening levels:

	DC Calculated	EPA Calculated
Benzene	0.8 $\mu\text{g}/\text{m}^3$ (10^{-6})	8 $\mu\text{g}/\text{m}^3$ (10^{-5})
MTBE	1.7 $\mu\text{g}/\text{m}^3$ (10^{-6})	17 $\mu\text{g}/\text{m}^3$ (10^{-5})

However, the letter from the Attorney General, dated August 31, 2007, to the Riggs Park residents suggests that the action levels for indoor air or soil vapor derived from 10^{-6} standard must be properly promulgated and published for comments prior to utilization as a standard. The Indoor Air Action levels that are derived from the one-in-a-million risk standard for the use of the DOH contractor have not been promulgated and hence not enforceable on Chevron. Therefore until DDOE promulgates indoor air action levels, the District will prevail by deferring to EPA's guidelines. Therefore, the District has referred to properly promulgated and published EPA Subsurface Vapor Intrusion Guidance document dated November 2002, EPA530-D-02-004-Draft Guidance For Evaluating The Vapor Intrusion To Indoor Air Pathway From Groundwater And Soils (www.epa.gov/correctiveaction/eis/vapor/complete.pdf). This guidance provides targeted indoor air concentrations set at 10^{-4} , 10^{-5} and 10^{-6} (incremental individual lifetime cancer risk) levels and a Hazard Quotient (HQ) of 1 for non-cancer risk. For the presence of multiple contaminants at a site, Federal 40 CFR Ch.1 Page 70 section 300.430 e)(2)(i)(A) mandates the use of 10^{-6} . The Riggs Park site has multiple contaminants.

Therefore, as per Table 2C, Target Indoor Air Concentration to Satisfy Both the Prescribed Risk Level and the Target Hazard Index [R= 10^{-6} , HI=1):

Benzene 0.31 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)
or 0.098 ppbv

As per Table 2C, Target Shallow Gas (Soil Vapor) Concentration Corresponding to Target Indoor Air Concentration Where the Soil Gas to Indoor Air Attenuation Factor=0.1

Benzene 3.1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)
or 0.98 ppbv

Under a Department of Health contract authorized and funded by the DC Council, Building Sciences and Engineering Associates, Ltd. performed indoor and outdoor air testing at 97 homes for which testing was authorized. The participating homes were provided an Individual Home Test Report directly forwarded from the contractor, which included chemical concentrations detected and the contractor's judgment as to whether the sources of each of the chemicals of concern were mainly from outdoor air sources, indoor air sources, and/or soil/vapor intrusion. Comparing the Benzene measurements completed under this contract with the above EPA's table suggest an elevated level of benzene in all homes but two. However, 53 homes were identified under high category for further actions. These were communicated by DOH to EPA in 2006 and early 2007.

In addition, District DCMR Section 6207.2 Regulation mandates that the responsible party shall submit a remedial plan that provides adequate protection of resident's health in accordance with maximum tolerable human health risks of one in a million standards as identified standards for the responsible party remedial plan implementation. The District has compared the impacted site media

measured data for compliance with this 10^{-6} standard. Data presented by Chevron under the Tables 5-2, 3, 4 and 5 as part of the baseline risk assessment for indoor air and soil vapor measurements suggest an elevated level of benzene in all homes for indoor air and all but three for soil vapor measurements resulting in a failure to comply.

In conclusion, EPA should use 10^{-6} as acceptable exposure standards instead of a value between 10^{-4} and 10^{-5} for Chevron's remediation plan in the District. There are several reasons for this conclusion which include the following:

1. The ground water clean-up level for Benzene as per Table 2C is based on 10^{-6} standard and a target groundwater concentration of 5 ppb which is enforced for this site. This is listed in the published EPA Subsurface Vapor Intrusion Guidance document dated November 2002, EPA530-D-02-004-Draft Guidance For Evaluating The Vapor Intrusion To Indoor Air Pathway From Groundwater And Soils (www.epa.gov/correctiveaction/eis/vapor/complete.pdf)
2. The soil clean-up level for Benzene (157 ppb) is based on the 10^{-6} standard and the soil remediation standard is developed based on 10^{-6} .
3. The District's recognized cancer risk Level is 10^{-6} as per the Attorney General.
4. District Regulations DCMR Section 6207.2 mandates the 10^{-6} standard for remediation and implementation.
5. The presence of multiple contaminants at a site, Federal 40 CFR Ch.1 Page 70 section 300.430 e)(2)(i)(A) mandates the use of 10^{-6} . The Riggs Park site has multiple contaminants.
6. EPA risk based concentration documents would expect to cause no more than 10^{-6} .
7. The ATSDR's Cancer Risk Evaluation Guides (CREGs), in which no chance exists for carcinogenic health effects, specifies 10^{-6} .
8. DC RBCA TIER level clean-ups are based on 10^{-6} (Page 2-5 RBCA published document)
9. The EPA calculation of 8 ug/m³ as the level between 10^{-4} and 10^{-5} is not codified in the Federal Regulations.
10. EPA staff hand calculated 8 ppb as 10^{-5} is not listed in EPA Subsurface Vapor Intrusion Guidance document dated November 2002, EPA530-D-02-004-Draft Guidance For Evaluating The Vapor Intrusion To Indoor Air Pathway From Groundwater And Soils (www.epa.gov/correctiveaction/eis/vapor/complete.pdf)
11. EPA action levels identified in Statement of Basis were never published in Federal Register with a public notice and comment period in accordance with promulgation procedures.
12. District never implemented lower level than 10^{-6} as a federally approved state program implemented by the District.

13. Using 10^{-6} for soil and groundwater clean-ups, which are in subsurface and addresses the ingestion and dermal, but not using the same standard for inhalation of vapors generated from these soil and groundwater lead to disparity in addressing the contaminant impacts and clean-up attainments.
14. District's request for lowering acceptable level to 10^{-6} could prevent additional cancer deaths. As per the established protocol, EPA should defer to DC to address matters that are implemented in the District more stringent than those of the federal government.

The District recommends the following general outline of further action to be taken by the responsible party:

- 1- Install permanent sub slab monitoring vapor ports to collect soil gas samples, and indoor air samples semi annually.
- 2- Implement engineering controls.
- 3- Mitigate indoor air exposure.
- 4- Retrofit existing building which includes the installation of a sub-slab venting system and frequent monitor of indoor air and soil vapor.

D. Soil Vapor Action Level

As per EPA guidance on explanation of soil Vapor Removal Action Levels document, using a dilution ratio of 10 between soil vapor concentrations and that of indoor air, SB must include:

Benzene	8 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)
Toluene	50,000 $\mu\text{g}/\text{m}^3$
Ethylbenzene	10,000 $\mu\text{g}/\text{m}^3$
Xylenes	1000 $\mu\text{g}/\text{m}^3$
MTBE	17 $\mu\text{g}/\text{m}^3$

VIII. COST

The proposed remedy is cost effective in meeting the remediation objectives. DOH has expended capital costs in testing 97 homes in Riggs Park. The results were used by EPA and Chevron for calculating Chevron indoor vapor remediation and approvals. The District is seeking an environmental testing firm to document, monitor and sample subsurface vapor intrusion in the Riggs Park Community by installing soil vapor ports, indoor air and ambient sampling, and soil sampling. The cost recovery with administrative cost to implement this project is due to the District. The DDOE will take the lead on cost recovery including staff resources expended for this site.

IX. COMMUNITY AND EPA ACCEPTANCE

Community acceptance of EPA's and District's proposed remedy will be evaluated by EPA, as per the letter from Abe Ferdas of EPA to Dr. Pane dated August 29, 2007, based on comments received during the 60 day public comment period and will be described in the Final Decision and Response to Comments. (See letter attached)

X. ALTERNATIVES

DOH has evaluated all alternatives provided by Chevron. The selected main remediation alternative is briefly described below with an explanation of the key reasons as to why it is recommended.

Installation of an Independent Groundwater and Soil Vapor Extraction Dual Phase Recovery and Treatment System in the Riggs Park community in the District of Columbia is recommended. This alternative involves installation of conventional recovery wells in the highly impacted Area B residential side and in the updated gasoline plume area as shown in the Figure 4 & 5. Installing inclined recovery wells will not resolve the groundwater and soil vapor contamination underneath the homes in the District of Columbia.

XI. PUBLIC PARTICIPATION

On August 30, 2007, EPA placed an announcement in the Washington Times and Washington Post to notify the public of EPA's proposed remedy and of the location of the Administrative Record. As per conference call held on August 23, 2007 between EPA and DOH, all alternatives were explained and thought to be productive. EPA sent a letter to this effect that this document will be added as part of the EPA Statement of Basis for public comments for final determination of remedy selection for this site. Therefore, the District is requesting comments from the public on the remedy proposed in this document during the EPA public comment period beginning August 30, 2007 and ending October 29, 2007. Comments regarding the Districts proposed remedy may be submitted directly to EPA:

Mr. Andrew Fan (3WC23)
U.S. EPA, Region III
1650 Arch Street
Philadelphia, PA 19103
Phone: (215) 814-3426
FAX: (215) 814-3113
Email: fan.andrew@epa.gov

All questions regarding the Districts proposed remedy and a copy of the comments submitted to EPA should be submitted to Dr. V. Sreenivas, D.C. Department of Health (V.Sreenivas@dc.gov) and George Hawkins, Acting Director, Department of the Environment (G.Hawkins@dc.gov).

After evaluation of all comments, EPA will prepare a Final Decision Document and Response to Comments (FDRTC) that identifies final selected remedy. The FDRTC will address all significant written comments and any significant oral comments generated at the public meeting and will be made available to the public. If, on the basis of such comments or other relevant information, significant changes are proposed to be made to the corrective measures identified by EPA in this SB, EPA may seek additional public comments.

The District anticipates that the final remedy will be implemented in consultation with DOH, DDOE, and the Riggs Park Environmental Health Advisory Committee as communicated in the following EPA letter to Dr. Pane.

“U.S. EPA LETTER TO DR. PANE, DIRECTOR”

Dr. Greg Pane
DC Department of Health
825 North Capitol Street, NE
Fourth Floor, Room 4199
Washington, DC 20002

Dear Dr. Pane:

Thank you for your letter dated August 17, 2007 to the United States Environmental Protection Agency (EPA) regarding the draft Chevron Statement of Basis. We have weighed all the factors related to your request and have decided that the most prudent path forward is to proceed with the Public Comment Period starting on August 30, 2007.

The EPA does agree with your suggestion for placement of the public notice. Therefore, the public notice will be published in both the Washington Times and the Washington Post on Thursday, August 30, 2007.

In an effort to ensure that the residents learn about the public comment period, as well as the public meeting scheduled for September 6, 2007, EPA representatives will deliver a fact sheet door-to-door to all the homes located in Riggs Park, which have been impacted by the gasoline release.

I had a very productive discussion with Dr. Sreenivas on August 23, 2007, regarding your concerns about the Department of Health (DOH) review of the Statement of Basis. Although EPA is not going to postpone the comment period beyond August 30, 2007, I want to assure you that the EPA will include your submission as part of the Statement of Basis. Upon receiving your comments, the EPA will place them as part of the Public Record, so that citizens can comment on them as part of the Public Comment Period.

During my conversation with Dr. Sreenivas, we discussed a number of issues which made the call very productive. Let me assure you, as I assured Dr. Sreenivas, that the DOH will have a significant role in the design and implementation of the remedy at Chillum.

If you have any further questions about the Statement of Basis, please contact me at 215-814-3143.

Sincerely,

/S/

Abraham Ferdas, Director
Waste and Chemicals Management Division

Cc:
Adrian Fenty, Mayor
Muriel Bowser, Council member
Linda Singer, Attorney General
George Hawkins, Acting Director, DDOE