KCE MATRIX

CONSULTING ENGINEERS
STRUCTURAL, CIVIL &
ENVIRONMENTAL

FEASIBILITY STUDY/ CORRECTIVE ACTION PLAN

Commercial Property
4311 – 4333 MacArthur Boulevard
Oakland, California

Prepared For:

AMG and Associates, LLC
16633 Ventura Boulevard, #1014
Encino, California 91436

KCE-2005-216E-WP3
July 18, 2014

1648 W. Glenoaks Blvd., Suite 102 • Glendale, CA 91201 • Tel (818) 500-0355 • Fax (818) 500-8580

TABLE OF CONTENTS

I. INTRODUCTION 1
II. SITE DESCRIPTION 1
III. BACKGROUND 1
IV. SCREENING 5
V. SOIL REMEDIATION - FEASIBILITY 6
A. TECHNICAL COMPARISON 6
1. Excavation, Removal and Disposal 6
2. Soil Vapor Extraction 7
3. Natural Attenuation 7
B. ECONOMICAL COMPARISON 8
C. RECOMMENDED METHOD 8
VI. GROUNDWATER REMEDIATION - FEASIBILITY 8
A. TECHNICAL COMPARISON 8
1. Groundwater Extraction and Treatment 8
2. Air Sparging/Vapor Extraction 9
3. In-Situ Modified Bio-Remediation/Oxidation 9
4. Natural Attenuation 10
B. ECONOMICAL COMPARISON 11
C. RECOMMENDED METHOD 11
VII. PROPOSED FEASIBILITY TESTS 11
A. SOIL REMEDIATION 11
1. Abandon Monitoring Well MW-4 11
2. Soil Excavation and Disposal 12
B. GROUNDWATER REMEDIATION 12
C. CONFIRMATORY GROUNDWATER SAMPLING 13
VIII. LIMITATIONS 14
IX. SIGNATURE AND CERTIFICATION 15

Attachments: Appendix A - Figures 1 through 5
Appendix B - Tables 1 through 4
Appendix C - Tables 1 and 2
Appendix D - Oxygen Release Compound (ORC) Advanced™ Calculations
Appendix E - Product specification brochure and Material Safety Data Sheet (MSDS) for ORC Advanced™

I. INTRODUCTION

KCE Matrix, Inc. (KCE Matrix) has prepared this Feasibility Study/Corrective Action Plan (FS/CAP) to evaluate various soil and groundwater remediation methodologies for the subject property and to propose the most appropriate corrective action to remediate the existing soil and groundwater contamination at the subject property. Preparation of this FS/CAP was specifically requested by the Regional Water Quality Control Board (RWQCB), San Francisco Bay in a letter dated April 3, 2014. This FS/CAP was developed based on the previously conducted environmental site assessment work performed by KCE Matrix since approximately 2012 for the subject property.

II. SITE DESCRIPTION

The subject property is located at the southwest corner of MacArthur Boulevard and High Street in Oakland, California. The vicinity of the property consists of commercial and residential properties. The subject property is currently undeveloped and vacant land, and measures approximately 41,200 square feet in a triangular-shaped configuration. A Location Map is shown in Appendix A, as Figure 1, and three site plans of the subject property are presented in Appendix A, as Figures 2 through 4.

III. BACKGROUND

Two large building structures were previously located at the subject property and the property had previously been used for automotive service businesses including a gasoline service station, a retail tire store and by Pacific, Gas and Electric Company as a utility sub-station. The subject property historically consisted of a larger tract of land which was gradually reduced through eminent domain by the expansions of MacArthur Boulevard and the freeway.

Previous subsurface environmental site assessment and remediation work for the subject property has included the following:

1. In September of 1999, a magnetometer survey was conducted by Clearwater Group, Inc. (CGI) and the results indicated the presence of three buried metal objects which were suspected to possibly be Underground Storage Tanks (UST's).
2. In October of 1999, subsurface environmental site assessment work was performed under the directive of the Department of Toxic Substances Control (DTSC) and elevated levels of Total Petroleum Hydrocarbon (TPH)-Motor Oil and lead were detected in the subsurface soil at concentrations of 16,000 milligrams per kilogram (mg/kg) and 1,700 mg/kg, respectively. Subsequently, subsurface soil remediation was performed by excavation and disposal.

3. In the year 2000, the DTSC collected and analyzed four soil samples from the subject site and elevated concentrations of TPH-Motor Oil and lead were detected in the subsurface soil.

4. On December 7, 2000, subsurface environmental site assessment work was performed by CGI when six exploratory borings were drilled and the subsurface groundwater was sampled in the six borings. The analytical results of the groundwater samples collected and analyzed indicated concentrations of TPH-Gasoline of 4,600 micrograms per liter (ug/L) and 13,000 ug/L in two of the six samples; concentrations of TPH-Diesel ranging from 210 ug/L to 14,000 ug/L in all six samples; and concentrations of TPH-Motor Oil of 580 ug/L and 46,000 ug/L in two of the six samples. Trace to elevated concentrations of Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) were also detected in three of the six groundwater samples collected.

5. In May of 2002, subsurface environmental assessment work was performed by Engineering/Remediation Resources Group, Inc. (ERRG) when eight borings were drilled and sampled to a depth of five feet below the ground surface (bgs). The analytical results of the shallow most soil samples collected from a depth of approximately 0.5 feet indicated elevated concentrations of lead up to 4,900 mg/kg. Soil samples collected at depths in excess of 0.5 feet indicated relatively lesser concentrations of lead with none in excess of 100 mg/kg.

6. In September of 2002, subsurface soil remediation work was implemented by ERRG when approximately 60 cubic yards of soil was excavated and disposed.

7. In March of 2003, subsurface environmental assessment work was performed by JMK Environmental Solutions, Inc. (JMK) when seven exploratory borings were drilled and sampled to a depth of 20 feet bgs. Groundwater was encountered at a depth of seven feet bgs. The analytical results of the soil samples collected indicated concentrations of lead ranging from 3.0 mg/kg to 8.9 mg/kg; TPH-Diesel concentrations ranging from non-detected to 17 mg/kg; TPH-Gasoline concentrations ranging from non-detected to 120 mg/kg; and Benzene concentration ranging from non-detected to 0.54 mg/kg. The analytical results of the groundwater samples collected indicated concentrations of lead ranging from 0.21 milligram per liter (mg/L) to 1.2 mg/L; TPH-Diesel concentrations ranging from 290 ug/L to 4,000 ug/L; TPH-Gasoline concentrations ranging from non-detected to 42,000 ug/L; and Benzene concentrations ranging from non-detected to 5,800 ug/L.

8. In March of 2004, environmental site assessment work was performed by JMK when eight surface soil samples were collected. The analytical results indicated no detectable concentrations of TPH-Gasoline and BTEX; TPH-Motor Oil concentrations ranging from 220 mg/kg to 8,500 mg/kg; TPH-Diesel concentrations ranging from 16 mg/kg to 570 mg/kg; and lead concentrations ranging from 7.4 mg/kg to 520 mg/kg.

9. In August of 2004, subsurface environmental site assessment work was performed by Questa Engineering Corporation (Questa) and M. Douglas Construction when ten exploratory borings were drilled and sampled to varying depths up to 9 feet bgs. The analytical results of the soil samples collected indicated TPH-Diesel concentrations ranging from non-detected to 250 mg/kg; and TPH-Motor Oil concentrations ranging from non-detected to 2,200 mg/kg.

10. In October and November of 2004, subsurface soil remediation work was implemented by Questa and M. Douglas Construction when approximately 5,000 tons of soil was excavated and disposed of off-site. In addition, one 100-gallon Waste Oil metal UST was discovered during excavation activities, and subsequently removed and disposed.

11. Based on the subsurface environmental site assessment and remediation activities performed as described above, the DTSC issued a "no further action" letter dated April 28, 2005 for the subsurface soil at the subject property and referred the case to the Alameda County Environmental Health Department to provide further oversight and address the remaining groundwater contamination at the property.

12. In October of 2006, subsurface environmental site assessment work continued when six exploratory borings were drilled and sampled to depths of approximately 21 to 28.5 feet bgs by Questa. Groundwater was encountered at depths ranging between 12 and 18 feet bgs. The analytical results of the soil samples collected indicated 1.7 mg/kg and 17 mg/kg concentrations of TPH-Diesel and TPH-Motor Oil, respectively, in only one of the six borings. The analytical results of the groundwater samples collected indicated TPH-Gasoline concentrations ranging from non-detected to 1,700 ug/L; TPH-Diesel concentrations ranging from 230 ug/L to 440 ug/L; a TPH-Motor Oil concentration of 330 ug/L in only one sample; BTEX concentrations ranging from non-detected to 240 ug/L; a Methyl-Tert-Butyl-Ether (MTBE) concentration of 2 ug/L in only one sample; and Lead concentrations ranging from non-detected to 1.6 ug/L.

13. On April 20, 2012, the Alameda County Environmental Health Department issued a letter entitled "Notice of Enforcement Referral" referring oversight for the subject site to the RWQCB, San Francisco Bay Region.

14. On August 27, 2012; representatives of KCE Matrix discussed the status of the environmental assessment work being performed for the subject property with Ms. Barbara Sieminski of the RWQCB, San Francisco Bay Region. Based on review and evaluation of the historic assessment data collected up to that time, it was agreed that additional site assessment work should consist of the following: 1) Installation of three groundwater monitoring and sampling wells, 2) Monitoring and Sampling of the three groundwater wells for a period of one year, and 3) Conduct a well survey to locate potential sensitive receptors up to a 1,000 foot radius beyond the property lines of the subject site. The RWQCB requested that a work plan be prepared and submitted to their office for review and consideration. Subsequently, KCE Matrix prepared and submitted an environmental site assessment work plan (designated as KCE-2005-216E-WP1) dated September 14, 2012 to the RWQCB.

15. On October 15, 2012; representatives of KCE Matrix discussed the approval status of the environmental assessment work plan for the subject property with Ms. Barbara Sieminski of the RWQCB, San Francisco Bay Region. Based on further review and evaluation of the historic assessment data, it was agreed that the site assessment work plan be revised to include the installation of one additional groundwater monitoring and sampling well (a total of four wells). The RWQCB requested that a work plan addendum be prepared and submitted to their office for review and consideration. Based on the revised scope of work, KCE Matrix prepared a work plan addendum designated as (KCE-2005-216E-WP1A) and dated November 1, 2012. The proposed work plan and work plan addendum was approved for implementation by the RWQCB, San Francisco Bay Region in a letter to the responsible party dated November 27, 2012.

16. On January 21 and 22, 2013, four groundwater monitoring and sampling wells (designated as MW-1 through MW-4) were drilled, installed and sampled in the locations shown in Appendix A, Figure 2. Two of the four new wells (designated as MW-1 and MW-4) were drilled and constructed to total depths of approximately 25 feet below the ground surface (bgs) and the two other wells (designated as MW-2 and MW-3) were drilled and constructed to total depths of approximately 35 and 30 feet bgs, respectively. Groundwater was encountered at depths ranging from 14 feet to 32 feet bgs during drilling. The depth to groundwater stabilized at depths ranging from 3.50 to 6.61 feet for the four wells after well installation and development activities were completed. The analytical results of the soil samples collected from the boreholes for monitoring wells MW-1 through MW-4 are presented in Appendix B, Tables 1a and 1b. Monitoring and purging data are summarized in Appendix B, Table 3. A summary of the site assessment work conducted is presented in a report designated (KCE-2005-216E-R1) prepared by KCE Matrix dated March 8, 2013.

17. From February of 2013 through April of 2013, KCE Matrix conducted a survey of wells and sensitive receptors in the general vicinity of the subject site. Based on the well and sensitive receptor survey performed within a radius of approximately 1,000 feet around the subject site, six sensitive receptors were identified. Five of the six receptors consisted of a school, children's club or health clinic, and one of the six receptors was a surface waterway known as Courtland Creek. The creek was located approximately 700 feet to the southwest of the subject property. A summary of the well and sensitive receptor survey work conducted is presented in a report designated (KCE-2005-216E-R2) prepared by KCE Matrix dated April 30, 2013.

18. On October 2, 2013, two additional groundwater monitoring and sampling wells (designated as MW-5 and MW-6) were drilled and sampled in the locations shown in Appendix A, Figure 2. The two wells were drilled and constructed to total depths of approximately 25 feet bgs. Groundwater was encountered at depths of 10 feet and 20 feet below the surface during drilling activities for wells MW-5 and MW-6, respectively. The depths to groundwater stabilized at 5.91 feet and 7.72 feet for wells MW-5 and MW-6, respectively, after well installation and development activities were completed. The analytical results of the soil samples collected from the

boreholes for monitoring wells MW-5 and MW-6 are presented in Appendix B, Tables 2a and 2b. Monitoring and purging data are summarized in Appendix B, Table 3. A summary of the site assessment work conducted is presented in a report designated (KCE-2005-216E-R3) prepared by KCE Matrix dated October 31, 2013.

The six groundwater monitoring wells (designated as MW-1 through MW-6) were last monitored and sampled on January 22, 2014. The groundwater monitoring data and the analytical results of the groundwater samples collected are presented in Appendix B, Tables 3, 4a and 4b, respectively. The groundwater elevations and contour lines of equal groundwater elevation on January 22, 2014 are presented in Appendix A, Figure 2. The concentrations of TPH-Diesel, TPH-Motor Oil, TPH-Gasoline, BTEX and MTBE detected in groundwater as sampled on January 22, 2014, are presented in Appendix A, Figure 3. Results of the monitoring and sampling activities conducted on January 22, 2014 are presented in a report designated as (KCE-2005-216E-QR4) prepared by KCE Matrix dated February 14, 2014.

IV. SCREENING

Based on the analytical results of the site assessment data collected to date, the extent of soil and groundwater contamination is defined. The most elevated concentrations of hydrocarbon contamination in soil and groundwater appears to be limited to the immediate vicinity of monitoring well MW-4 on the subject property. The hydrocarbon contaminants that have been investigated in association with this site are TPH-Diesel, TPH-Motor Oil, TPH-Gasoline, Benzene, Toluene, Ethylbenzene, Xylenes, Methyl-Tert-Butyl-Ether (MTBE), and four other fuel oxygenates.

The Environmental Protection Agency (EPA) Region IX screening levels for the contaminants in subsurface soil being investigated as published in November of 2013 are as follows:

Screening Levels	
CONTAMINANT	Residential Soil (in milligrams per kilogram)
Gasoline	NA
Benzene	1.1
Toluene	500
Ethylbenzene	5.4
Xylenes	63
MTBE	43

Of the contaminants of concern, Benzene is considered to be the most carcinogenic and has the lowest Maximum Contaminant Level (MCL) for drinking water as defined by the California Code of Regulations (CCR), Title 22. The MCL's for the contaminants in groundwater being investigated are as follows:

Maximum Contaminant Levels of Selected Organic Chemicals As defined by the California Code of Regulations, Title 22	
CONTAMINANT	MCL (in micrograms per liter)
Gasoline	NA
Benzene	1
Toluene	150
Ethylbenzene	300
Xylenes	1,750
MTBE	13

Based on the fact that the above listed contaminants have been detected in subsurface soil and groundwater during previously conducted site assessments as presented in Section III above, and based on the carcinogenic nature of these contaminants, KCE Matrix proposes that remedial action be implemented.

V. SOIL REMEDIATION-FEASIBILITY

A. TECHNICAL COMPARISON

With regard to soil remediation, the following three remedial options are to be considered for comparison:

1. Excavation, removal and disposal
2. Soil vapor extraction
3. Natural attenuation

1. Excavation, Removal and Disposal

Soil excavation, transportation and disposal is considered a feasible means of remediation for the subject site based on the depth of elevated concentrations of hydrocarbons as detected during previously conducted site assessments. The most elevated concentrations of subsurface soil contamination remaining were detected approximately 10 feet to 15 feet below the ground surface in the immediate vicinity of monitoring well MW-4 only. Excavating to the depth of approximately 15 feet below the ground surface at the subject site is considered feasible since the site is currently vacant land, with no structures, surface improvements or occupants. Based on

the fact that the site is currently inactive, and based on the fact that the subsurface soil contamination is limited to an area in the vicinity of monitoring well MW-4 at depths of 10 to 15 feet below the ground surface; excavation, removal and disposal is considered a feasible means of soil remediation.

2. Soil Vapor Extraction

Soil Vapor Extraction (SVE) requires installation of vapor extraction wells. Once installed, a pilot soil vapor extraction test is conducted to evaluate various vapor extraction parameters including but not limited to extraction flow rates, vapor concentrations, applied pressure, and radius of influence. Once the vapor extraction pilot test is completed, a network of vapor extraction wells are installed based on the results of the pilot test. Subsequently, vapor extraction equipment is installed and connected through a network of subsurface pipes. In addition, the vapor extraction equipment is typically located within an above ground enclosure to treat the extracted and contaminated vapors prior to emission.

The success of this method relies on the ability of the contaminants to volatilize in subsurface areas in the vadose zone. Further, generally porous soils and a reasonably wide radius of influence for vapor extraction are also needed in order to extract the contaminated vapors from the subsurface in an effective and efficient manner.

The native soils in the area of contamination consist of essentially clayey sand, which generally reduces the efficiency and success of vapor extraction as a remedial technique. In addition, based on the fact that the residual soil contamination is confined to an approximately five foot layer extending from 10 to 15 feet below the ground surface; and based on the fact that the depth to groundwater is approximately five to eight feet below the surface; the contaminated column of subsurface soil is located in the saturated zone beneath the top of the water table, making the area of contamination "unaccessable" for remediation by vapor extraction. Therefore, SVE is not considered as a feasible remedial alternative for the subject property.

3. Natural Attenuation

Natural attenuation of the hydrocarbon contaminants detected in subsurface soil (and groundwater) should not be considered for the subject property based on the fact that elevated concentrations of petroleum hydrocarbons have been detected in subsurface soil at depths of 10 to 15 feet below the surface. Furthermore, elevated concentrations of petroleum hydrocarbons have also been detected in one of the six wells currently on site and the concentrations have not decreased significantly since the inception of monitoring and sampling activities, over an extended period of time. Therefore, it does not appear that natural biodegredation of hydrocarbon contaminants will occur in a reasonable period of time.

B. ECONOMICAL COMPARISON

Generally, excavation, removal and disposal of contaminated soil (if confined to a fairly small area and at accessible depths) is typically more cost efficient than soil vapor extraction. Soil vapor extraction is generally more cost efficient as compared to excavation and disposal when the amount of soil to be removed is relatively large and/or the location of contaminated soil is relatively deep. Based on the fact that the elevated soil contamination detected at the subject property is limited to a depth of approximately 10 to 15 feet below the surface and limited to an area in the vicinity of monitoring well MW-4; excavation, removal and disposal of the contaminated soil appears to be the most cost efficient method of soil remediation for the subject site. Based on the scope of work required for the subject site, the typical costs for both excavation and disposal and soil vapor extraction are presented in Appendix C, Table 1.

C. RECOMMENDED METHOD

Based on the fact that the site is a vacant dirt lot with no structures, surface improvements or tenants/occupants; based on the fact that the subsurface soil contamination is limited to a depth of approximately 10 to 15 feet below the surface and limited to an area in the vicinity of monitoring well MW-4; and based on the technical and economical analyses and comparisons presented above; excavation, removal and disposal of the contaminated soil is both a technically and economically feasible method of soil remediation for the subject site. Therefore, KCE Matrix recommends that soil remediation be implemented by excavation, removal and disposal.

VI. GROUNDWATER REMEDIATION-FEASIBILITY

A. TECHNICAL COMPARISON

With regard to groundwater remediation, the following four groundwater remediation options are considered for comparison:

1. Groundwater extraction and treatment
2. Air sparging/vapor extraction
3. In-situ modified oxidation
4. Natural attenuation

1. Groundwater Extraction and Treatment

Groundwater extraction and treatment initially requires implementation of a single-well extraction test using groundwater monitoring wells. Based on the results of the single-well tests, an initial determination with regard to the feasibility of extraction of groundwater from the subject site is made. If determined feasible, an aquifer test is subsequently conducted. Once the aquifer test is completed, a network of extraction wells are installed based on the hydraulic conductivity and radii of influence calculations made from the data obtained during the single-

well extraction tests and/or the aquifer test. Subsequently, groundwater extraction equipment is installed using the extraction wells and through a network of subsurface pipes. In addition, groundwater treatment equipment is installed within an above ground enclosure to treat the extracted and contaminated groundwater prior to disposal.

The success of this methodology is based on the ability to extract appreciable amounts of groundwater from the extraction wells with a sufficient radius of influence in order to extract the majority of contaminants.

Typically, loose sand, gravelly sand and silty gravel water bearing zones may yield a substantial amount of groundwater, but may or may not necessarily yield appreciable amounts of the hydrocarbon contaminants when pumped, thereby resulting in an inefficient remedial alternative. On the other hand, tight silty/clayey sand and silty clay water bearing zones typically do not yield appreciable amounts of groundwater, thereby making this method technically not feasible.

Based on the environmental site assessment work performed, the native soils in the area of contamination consist of essentially clayey sand; and the subject property has a semi-confined aquifer. Therefore, groundwater extraction and treatment is not considered as a feasible remedial alternative for the subject property.

2. Air Sparging/Vapor Extraction

A pilot air sparging test is conducted to evaluate various air injection and vapor extraction flow rates for a given site. Once the air sparging test is completed, a network of air sparging wells are installed based on the results of the pilot test. Subsequently, air injection and vapor extraction equipment are installed using the air sparging wells and through a network of subsurface pipes. In addition, vapor extraction and groundwater treatment equipment are installed within an above ground enclosure to treat the extracted and contaminated vapors prior to emission and the contaminated groundwater prior to disposal.

The success of this method relies on the ability to inject an appreciable volume of air into the water bearing zone to allow the contaminants to volatilize promoting and enhancing removal. Further, a reasonably wide radius of influence of vapor extraction is also needed in order to extract the contaminated vapors from the subsurface. This method may not be feasible based on the fact that the native subsurface soil lithology is comprised of principally clayey sands, which will negatively impact the efficiency of air sparging/vapor extraction by reducing the radius of influence of vapor extraction.

3. In-Situ Modified Bio-Remediation/Oxidation

In-situ modified bio-remediation/oxidation requires conducting a treatability study for determining system design parameters. This entails conducting a treatability study both in the laboratory and in-situ for treatment of the contaminated groundwater, and conducting single-well and/or well recovery and/or aquifer tests to determine hydraulic aquifer characteristics. Upon

completion of the treatability study, the data obtained are used to design a treatment system. The treatment system generally includes the installation of additional injection and recovery wells, installation of an above ground batching and mixing plant to continually formulate the appropriate treatment dosages, along with a system of pumps and injection piping for dispersing the appropriate doses.

The success of this method is dependent on conducting the appropriate and successful treatability study, and to properly incorporate the data obtained during the study into the final treatment system. The introduction of an oxidation solution must be continually monitored to best control the oxidation and reduction processes occurring in the subsurface. Furthermore, the hydraulic characteristics of the affected water bearing zones must be sufficiently understood to ensure proper distribution of the oxidation solution to the contaminated areas. Typically, permeable subsurface lithology is needed in order for this method to be successful and efficient.

With regard to the subject site, the subsurface lithology is comprised of essentially clayey sands at the depths where groundwater is encountered. However, based on the analysis presented in Section V above, where the recommended soil remediation method has been determined to be excavation and disposal, excavation to the depth of groundwater will provide the necessary accessibility to the contaminated groundwater area in need of remediation. This accessibility is not always possible when the subsurface soil is not permeable, when the depth to groundwater is too great to allow for excavation to the depth of groundwater, and/or when the site is occupied by an operating business making it difficult to excavate any significantly large areas on site. By excavating to the depth of groundwater (approximately 10 to 15 feet below the ground surface), the oxidation reagents can be directly applied to the contaminated groundwater area that has been affected, thereby resulting in the most efficient application of this technology that is possible. With proper monitoring of the oxidation and reduction processes and accurate hydraulic information, this method can be successful in remediating the hydrocarbon contamination currently on site.

4. Natural Attenuation

Natural attenuation of the hydrocarbon contaminants detected in the groundwater should not be considered for the subject property based on the fact that elevated concentrations of petroleum hydrocarbons detected in the monitoring well designated as MW-4 have not decreased significantly since the inception of monitoring and sampling activities, over an extended period of time. Therefore, it does not appear that natural biodegredation of hydrocarbon contaminants will occur within a reasonable period of time.

B. ECONOMICAL COMPARISON

Generally, groundwater pumping and treating is an expensive groundwater remediation methodology based on the fact that there is a large capital investment in the extraction and treatment equipment, along with relatively high disposal costs of treated groundwater. Air sparging in conjunction with vapor extraction is typically more cost efficient than groundwater pump and treat based on the fact that while there is also a significant capital investment for extraction and treatment equipment, the costs for disposal are significantly less. In-situ modified bio-remediation/oxidation is typically a more cost efficient groundwater remediation method based on the fact that there is a significantly lower capital investment for obtaining and installing treatment equipment on site. Furthermore, there are minimal disposal costs. Finally, natural attenuation tends to be the most cost efficient scenario assuming that it is technically feasible and that contaminants will indeed biodegrade within a reasonable period of time. The typical costs for the various groundwater remediation methods evaluated in this study for the scope of work currently required for the subject property is presented in Appendix C, Table 2.

C. RECOMMENDED METHOD

Based on the site-specific assessment data collected to date, groundwater extraction and treatment and air sparging/vapor extraction do not appear to be technically feasible groundwater remediation methods for the subject property. However, in-situ modified bio-remediation/oxidation appears to be a technically feasible groundwater remediation method, and based on the economic evaluation performed, is also more economically feasible and efficient as compared to the two other options. Therefore, KCE Matrix recommends that in-situ modified bio-remediation/oxidation be implemented (in conjunction with soil excavation and disposal) as the groundwater remedial method for the subject site.

VII. PROPOSED REMEDIAL ACTION

A. SOIL REMEDIATION

1. Abandon Monitoring Well MW-4

In order to facilitate implementation of soil and groundwater remediation, it will be necessary to abandon existing monitoring well MW-4 prior to performing excavation and remediation work on site. KCE Matrix proposes abandoning well MW-4 by removal of all materials within the borehole including the well casing, filter pack and annular seal per the California Well Standards Bulletin 74-90 and/or per the appropriate Alameda County guidelines for proper well abandonment. Prior to abandoning the well, the appropriate permit will be obtained from Alameda County Public Works Agency.

2. Soil Excavation and Disposal

KCE Matrix recommends implementation of subsurface soil remediation by excavating and disposing of the contaminated soils in the vicinity of monitoring well MW-4. The area of proposed remediation is shown in Appendix A, Figure 4.

Soil samples will be collected from the excavated area in an effort to define the extent of shallow subsurface soil contamination. Soil samples will be collected and analyzed in a manner define the extent of subsurface soil contamination and confirm completion of soil remediation in the immediate vicinity of the excavated areas. Soil samples will be collected for lithologic logging purposes, laboratory analysis and to be field-tested for Volatile Organic Compounds (VOC's) using a Photo Ionization Detector (PID). Classification of soil will be done using the Unified Soils Classification System (USCS) by KCE Matrix's field engineer or geologist. All excavated soil material will be stockpiled on site and sampled for proper characterization in preparation for profiling and disposal at an approved facility. The samples to be designated for analysis will be labeled and stored on ice for delivery to a State certified laboratory and analyzed as follows:

- TPH-Diesel and TPH-Motor Oil by EPA method 8015B; and TPH-Gasoline, VOC's and four fuel oxygenates by EPA method 8260B.

Based on the proposed area and depth to be excavated, it is estimated that approximately 500 to 800 tons of soil will be excavated during implementation of remedial action, and approximately 250 to 300 tons of subsurface soil material will be removed and disposed.

All work to be performed as proposed will be conducted by and/or under the supervision of KCE Matrix's California State Professional Civil Engineer or Certified Engineering Geologist. A summary report describing the well abandonment and soil remediation activities performed will be prepared and submitted to the RWQCB, San Francisco Bay Region for their review and consideration.

B. GROUNDWATER REMEDIATION

Based on the historic groundwater monitoring and sampling data collected to date, the area of groundwater contamination appears to be limited to an area in the immediate vicinity of monitoring well MW-4.

Based on the analysis presented in Section VI above, KCE Matrix proposes implementation of groundwater remediation by in-situ modified bio-remediation/oxidation (in conjunction with soil excavation and disposal). Groundwater remediation will be implemented by excavation of infiltration pit(s) in the area of concern, extraction and disposal of any accessible contaminated groundwater in the excavation cavity, and injection of Oxygen Release Compound (ORC) Advanced™. The proposed excavation described in Section VII-A above for implementation of soil remediation can also be used as an infiltration pit, thereby allowing simultaneous and efficient implementation of groundwater remediation in an aggressive manner.

KCE Matrix has calculated an estimated amount of approximately 2,500 pounds of ORC Advanced™ to be applied to the residual mass of hydrocarbon-impacted soil and water in the area to be remediated. The calculated amount of ORC Advanced™ proposed to be used is presented in Appendix D.

KCE Matrix will apply the ORC Advanced™ utilizing two of the four recommended types of application/installation as outlined in detail in the attached Regenesis Oxygen Release Compound (ORC) Installation Instructions (Excavation Applications). KCE Matrix proposes to utilize Installation "Type 2" for the soil to be back-filled in the excavation pit and Installation "Type 4" – Backhoe Method for the standing water and/or the saturated zone in the bottom of the excavation. A product specification brochure and Material Safety Data Sheet (MSDS) for ORC Advanced™ are presented in Appendix E. The proposed area of excavation, groundwater extraction and ORC injection in the immediate vicinity of monitoring well MW-4 is shown in Appendix A, Figure 4.

All work to be performed as proposed will be conducted by and/or under the supervision of KCE Matrix's California State Professional Civil Engineer or Certified Engineering Geologist. A summary report describing the groundwater remediation activities performed will be prepared and submitted to the RWQCB, San Francisco Bay Region for their review and consideration.

C. CONFIRMATORY GROUNDWATER SAMPLING

Upon completion of remedial action as proposed above, KCE Matrix proposes the installation of one groundwater monitoring well (to be designated as MW-4A) at or near the location of the former and abandoned well MW-4 as shown in Appendix A, Figure 4. Prior to drilling and installation, the appropriate permit will be obtained from Alameda County Environmental Health Department.

Based on historic monitoring data collected, groundwater is anticipated at a depth ranging from approximately three to eight feet below the surface. Therefore, the proposed monitoring well (to be designated as MW-4A) will be installed to a depth of approximately 20 feet below the ground surface. The new well will be drilled using hollow-stem auger equipment and the well casing will consist of two-inch diameter, schedule 40 PVC pipe with flush threaded joints and 0.02-inch factory slots. The well screen will be installed from the total depth of the well to approximately five feet below the ground surface. Monterey sand (#3) will fill the annular space from the total depth of each well to two feet above the perforated casing interval. A two-foot bentonite seal will be placed in the annular space above the sand pack. Neat cement or a nine-sack cement and sand slurry will be placed above the bentonite seal to the surface. The well casing will be secured with a waterproof cap. A round, flush-mounted well cover will be concreted in place over the top of each casing. A proposed well construction diagram for well MW-4A is presented in Appendix A, Figure 5.

Upon completion of the installation of well MW-4A, the current groundwater monitoring and sampling program will continue to be implemented to evaluate the effectiveness of groundwater remedial action. Specifically, KCE Matrix recommends monitoring and sampling monitoring well MW-4A on a quarterly basis for four quarters (one hydrogeologic cycle); and wells MW-1, MW-2, MW-3, MW-5 and MW-6 on a semi-annual basis for two events, after remedial activities are completed. The results of the post-remedial groundwater monitoring and sampling activities should be evaluated to prepare any subsequent recommendations, as may be necessary, or confirm completion of remedial action. Groundwater monitoring and sampling summary reports should continue to be prepared and submitted to the RWQCB, San Francisco Bay Region for their review and consideration.

VIII. LIMITATIONS

Site-specific subsurface conditions such as soil deposits and rock formations may vary in thickness, lithology, saturation strength and other properties across any site beyond what available documentation indicates. Therefore, it is possible that undocumented or concealed improvements or alterations to the property could exist beyond the inquiry of the activities conducted during this site assessment. In addition, environmental changes, either naturally occurring or artificially induced, may cause changes or alterations (which can be significant) to the property as compared to the conditions found at the time that this assessment is conducted.

Based on the best available investigative technologies, no amount of assessment can guarantee that the subject property does not contain contaminants or hazardous substances. The activities to be conducted during this limited investigation cannot identify all potential concerns for the subject property, and do not eliminate the possibility that the subject property is completely free of environmental concerns.

KCE Matrix will analyze and evaluate the information to be collected during this investigation using what we believe to be the currently applicable engineering techniques and principles. KCE Matrix assumes no liability from other parties involved in losses sustained as a result of decisions made based on interpretations of this work plan. KCE Matrix makes no warranty, either expressed or implied, regarding the work to be conducted, except that our services will be performed in accordance with generally accepted professional principles and practices existing for such work.

This work plan and all information obtained during this site assessment are considered confidential and will not be released without written permission by the owner of the subject property, the owner authorized entity conducting this assessment, or as required by law. The owner of the subject property is responsible for mitigation of contamination, corrective or remedial action, and disclosure of any information obtained during this site assessment or information contained in this work plan.

IX. SIGNATURE AND CERTIFICATION

KCE Matrix appreciates the opportunity to have provided services for this project. Should you have any questions or concerns regarding this assessment and report, please do not hesitate to contact me at 818-500-0355.

Sincerely,

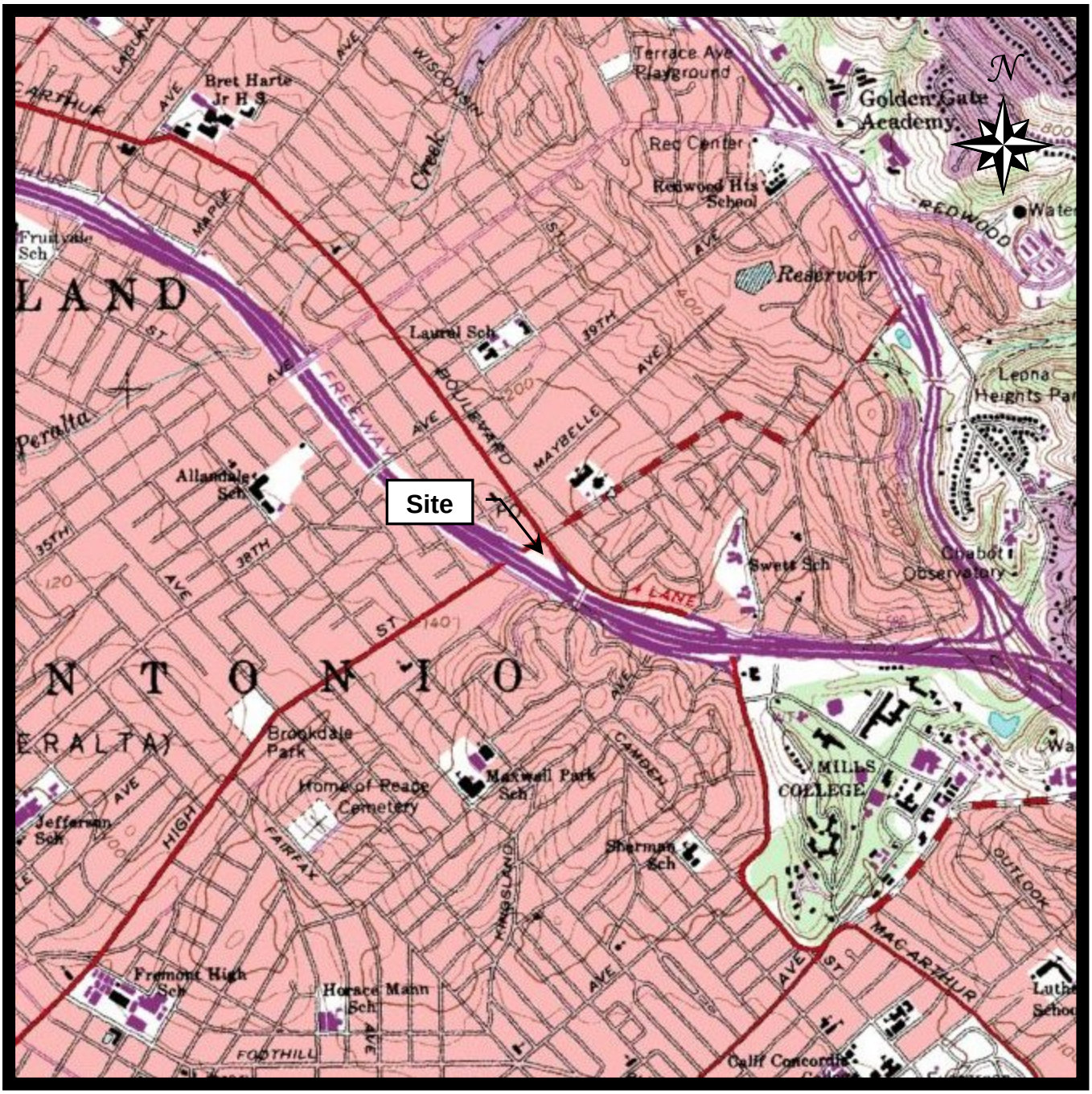
KCE Matrix, Inc.

Aram B. Kaloustian, P.E.
Project Manager

License No. C52428
Expiration Date: 12/31/14

APPENDIX A

(FIGURES 1 THROUGH 5)

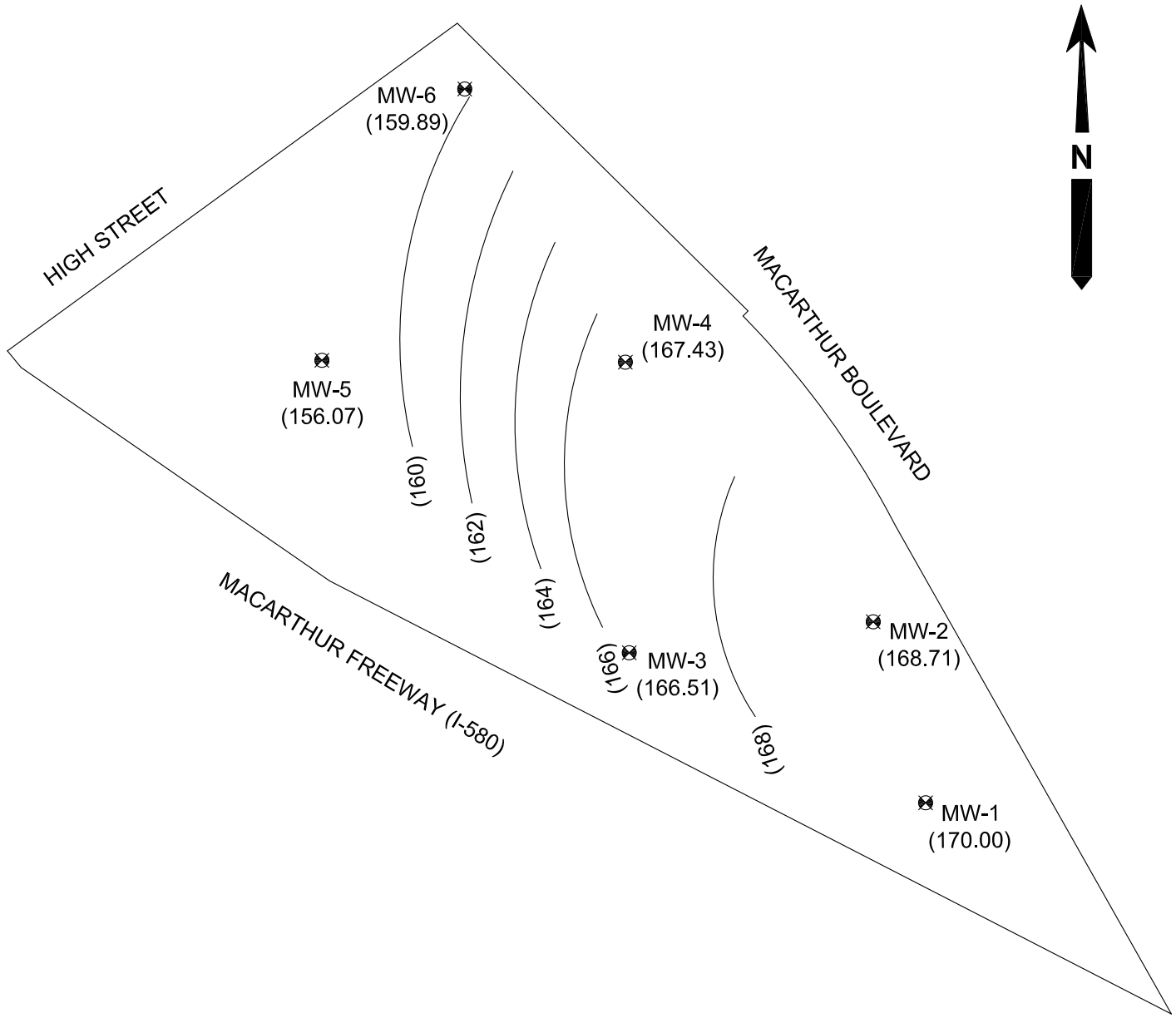


Map center is Latitude 37.7870, Longitude - 122.194
Subject site is located on the USGS **Oakland East** quadrangle (Map Source Year: 1980)

0 0.3 0.6
Approx. scale mile

Adapted from MyTopo.com – Map Pass Subscription Service

SITE LOCATION MAP		
KCE MATRIX	COMMERCIAL PROPERTY 4311-4333 MacARTHUR BLVD. OAKLAND, CALIFORNIA	PROJECT ID: KCE-2005-216E FIGURE 1



LEGEND

⊗ Groundwater Monitoring Well

( ) Groundwater elevation in feet above Mean Sea Level

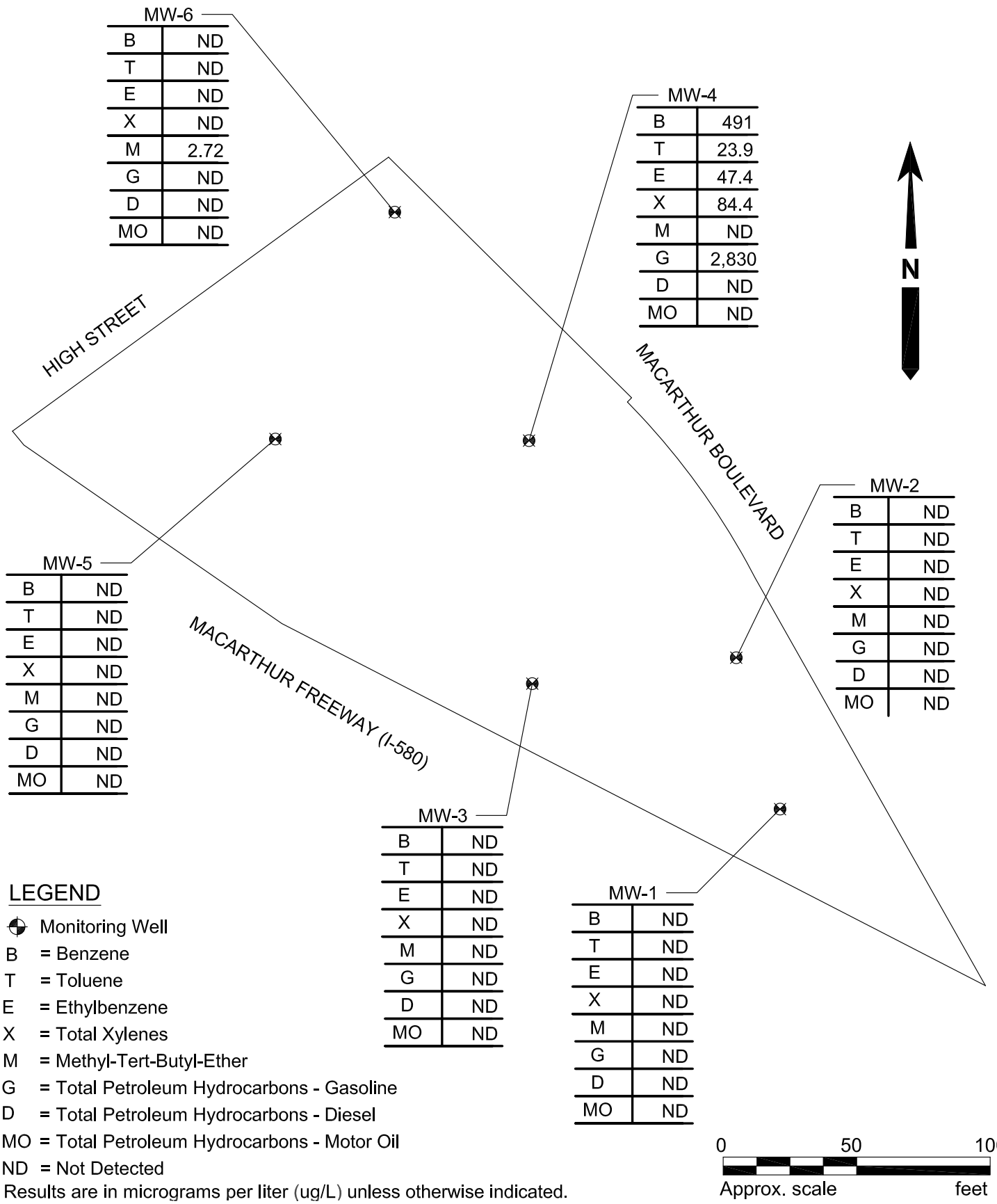
⌣ Contours of equal groundwater elevation

0 50 100

Approx. scale feet

SITE PLAN - WELL LOCATIONS & GROUNDWATER ELEVATIONS ON 01/22/2014

KCE MATRIX	COMMERCIAL PROPERTY 4311-4333 MACARTHUR BLVD. OAKLAND, CALIFORNIA	PROJECT ID: KCE-2005-216E FIGURE 2



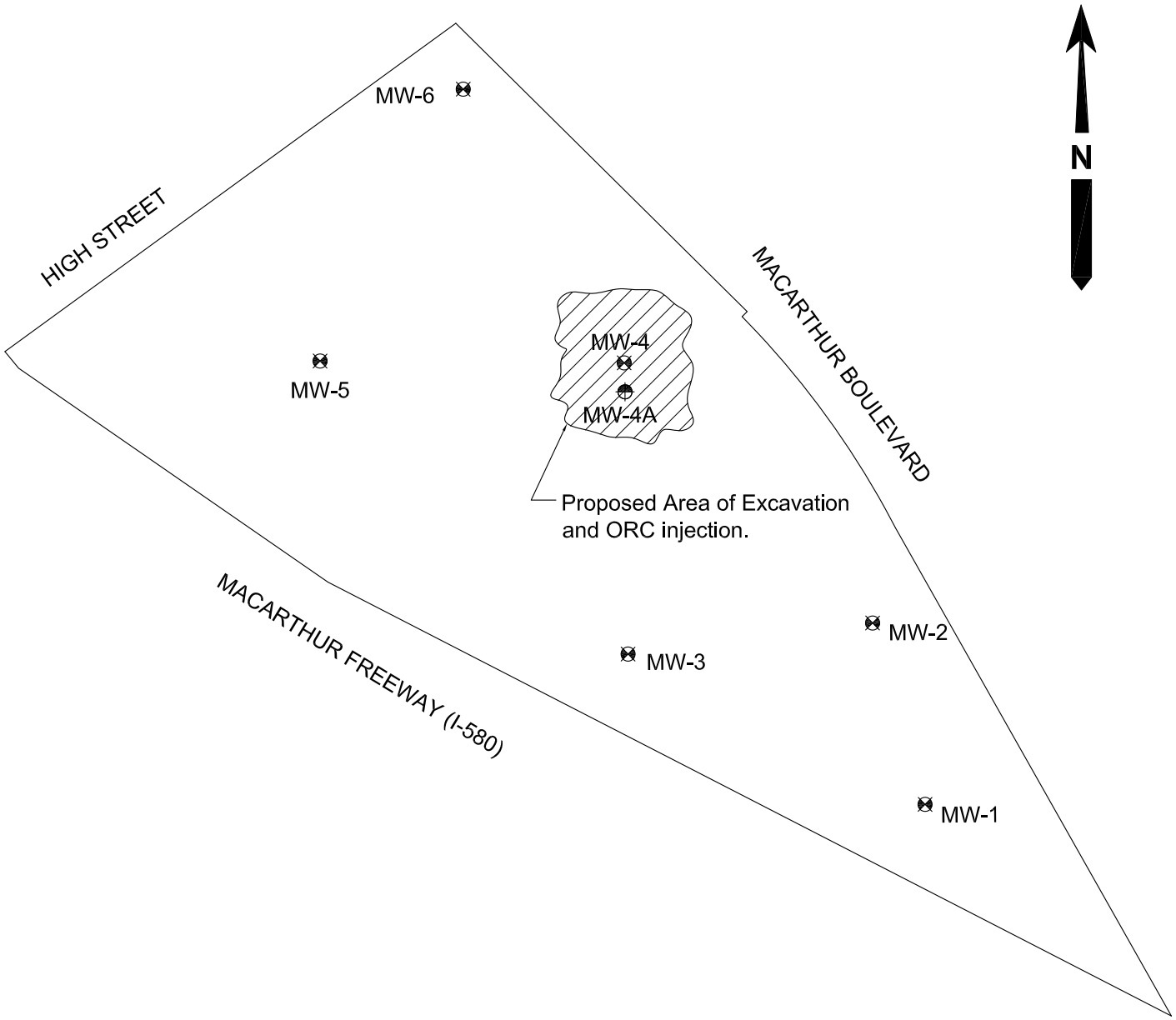
LEGEND

- Monitoring Well
- B = Benzene
- T = Toluene
- E = Ethylbenzene
- X = Total Xylenes
- M = Methyl-Tert-Butyl-Ether
- G = Total Petroleum Hydrocarbons - Gasoline
- D = Total Petroleum Hydrocarbons - Diesel
- MO = Total Petroleum Hydrocarbons - Motor Oil
- ND = Not Detected

Results are in micrograms per liter (ug/L) unless otherwise indicated.

HYDROCARBON CONCENTRATION IN GROUNDWATER ON 01/22/2014

KCE MATRIX	COMMERCIAL PROPERTY 4311-4333 MACARTHUR BLVD. OAKLAND, CALIFORNIA	PROJECT ID: KCE-2005-216E FIGURE 3



LEGEND

- Groundwater Monitoring Well
- Groundwater Monitoring Well (Proposed)

0 50 100
Approx. scale feet

SITE PLAN - PROPOSED SOIL AND GROUNDWATER REMEDIATION AREA

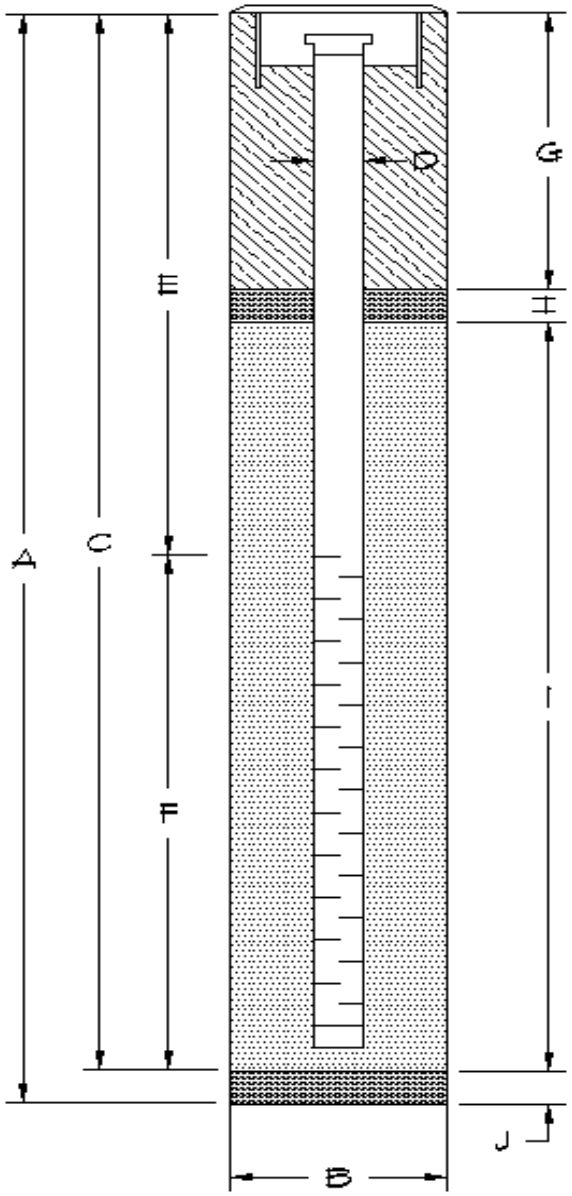
KCE MATRIX	COMMERCIAL PROPERTY 4311-4333 MACARTHUR BLVD. OAKLAND, CALIFORNIA	PROJECT ID: KCE-2005-216E FIGURE 4

KCE MATRIX	PROPOSED WELL CONSTRUCTION DIAGRAM	Boring/Well Number
		MW-4A

Project Number: KCE-2005-216E
Project Name: Commercial Property
Location: 4311 - 4333 MacArthur Boulevard
Oakland, California

Well Permit Number: TBD
Date: TBD

Flush-mounted Well Cover



A. Total Depth: 20'
B. Boring Diameter: 8"
Drilling Method: Hollow Stem Auger
C. Casing Length: 20'
Material: (Schedule 40 PVC)
D. Casing Diameter: OD = 2.375"
ID = 2.067"
E. Depth to Perforations 5' (0' - 5')
F. Perforated Length: 15' (5' - 20')
Perforation Type: Machined Slot
Perforation Size: 0.020"
G. Surface Seal: 2' (0' - 2')
Seal Material: Neat Cement and/or Grout
H. Seal: 2' (2' - 4')
Seal Material: Bentonite
I. Filter Pack: 16 (4' - 20')
Pack Material: RMC Lonestar Sand
Size: #3
J. Bottom Seal: N/A
Seal Material: N/A

FIGURE 5

APPENDIX B

(TABLES 1 THROUGH 4)

TABLE 1a

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on January 21 through January 22, 2013 by KCE Matrix, Inc.)

Sample Identification	Depth	EPA 8015B		EPA 8260B										
		Oil Range Organics	Semi-Volatile Hydrocarbons (Diesel)	Volatile Hydrocarbons (Gasoline)	Benzene	Toluene	Ethyl-Benzene	o-Xylene	m-& p-Xylenes	MTBE	Ethyl-tert-butylether	Di-isopropylether	tert-amylmethylether	tert-Butylalcohol
	(Feet)	mg/Kg	mg/Kg	mg/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
MW-1 (5)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1 (10)	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1 (15)	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2 (5)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2 (10)	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2 (15)	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3 (5)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3 (10)	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3 (15)	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4 (5)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4 (10)	10	ND	ND	132	2,050	3,380	4,480	6,040	18,200	ND	ND	ND	ND	ND
MW-4 (15)	15	ND	ND	0.930	223	93.9	51.8	50.7	179	ND	ND	ND	ND	ND

MTBE = Methyl-Tertiary-Butyl-Ether
ND = Not Detected at or above Reporting Limit
ug/Kg = micrograms per kilogram
mg/Kg = milligrams per kilogram

TABLE 1b

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on January 21 through January 22, 2013 by KCE Matrix, Inc.)

Sample ID	MW-1(5)	MW-1(10)	MW-1(15)	MW-2(5)	MW-2(10)	MW-2(15)
Depth	5	10	15	5	10	15
Organics	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
Acetone	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	ND	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ND	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
ETBE	ND	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/Kg = micrograms per kilogram

TABLE 1b

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on January 21 through January 22, 2013 by KCE Matrix, Inc.)

Sample ID	MW-1(5)	MW-1(10)	MW-1(15)	MW-2(5)	MW-2(10)	MW-2(15)
Depth	5	10	15	5	10	15
Organics	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
Ethylbenzene	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ND	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND
TAME	ND	ND	ND	ND	ND	ND
TBA	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND
Vinyl acetate	ND	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND
m- & p-Xylenes	ND	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/Kg = micrograms per kilogram

TABLE 1b

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on January 21 through January 22, 2013 by KCE Matrix, Inc.)

Sample ID	MW-3(5)	MW-3(10)	MW-3(15)	MW-4(5)	MW-4(10)	MW-4(15)
Depth	5	10	15	5	10	15
Organics	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
Acetone	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	2,050	223
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	ND	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	532	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ND	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
ETBE	ND	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/Kg = micrograms per kilogram

TABLE 1b

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on January 21 through January 22, 2013 by KCE Matrix, Inc.)

Sample ID	MW-3(5)	MW-3(10)	MW-3(15)	MW-4(5)	MW-4(10)	MW-4(15)
Depth	5	10	15	5	10	15
Organics	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
Ethylbenzene	ND	ND	ND	ND	4,480	51.8
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	374	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND	98.0	ND
MTBE	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ND	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	596	ND
n-Propylbenzene	ND	ND	ND	ND	1,070	ND
TAME	ND	ND	ND	ND	ND	ND
TBA	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	ND	ND	ND	ND	3,380	93.9
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND	7,180	19.4
1,3,5-Trimethylbenzene	ND	ND	ND	ND	1,850	ND
Vinyl acetate	ND	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	6,040	50.7
m- & p-Xylenes	ND	ND	ND	ND	18,200	179

ND = Not Detected at/above reporting limit
µg/Kg = micrograms per kilogram

TABLE 2a

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on October 2, 2013 by KCE Matrix, Inc.)

Sample Identification	Depth	EPA 8015B		EPA 8260B										
		Oil Range Organics	Semi-Volatile Hydrocarbons (Diesel)	Volatile Hydrocarbons (Gasoline)	Benzene	Toluene	Ethyl-Benzene	o-Xylene	m-& p-Xylenes	MTBE	Ethyl-tert-butylether	Di-isopropylether	tert-amylmethylether	tert-Butylalcohol
	(Feet)	mg/Kg	mg/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
MW-5 (5)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5 (10)	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5 (15)	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6 (5)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6 (10)	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6 (15)	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MTBE = Methyl-Tertiary-Butyl-Ether
ND = Not Detected at or above Reporting Limit
ug/Kg = micrograms per kilogram
mg/Kg = milligrams per kilogram

TABLE 2b

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on October 2, 2013 by KCE Matrix, Inc.)

Sample ID	MW-5(5)	MW-5(10)	MW-5(15)	MW-6(5)	MW-6(10)	MW-6(15)
Depth (ft)	5	10	15	5	10	15
Organics	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
Acetone	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	ND	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	ND	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ND	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
ETBE	ND	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/Kg = micrograms per kilogram

TABLE 2b

ANALYTICAL LABORATORY RESULTS FOR SOIL SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California
(Soil samples collected on October 2, 2013 by KCE Matrix, Inc.)

Sample ID	MW-5(5)	MW-5(10)	MW-5(15)	MW-6(5)	MW-6(10)	MW-6(15)
Depth (ft)	5	10	15	5	10	15
Organics	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
Ethylbenzene	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	ND	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND
TAME	ND	ND	ND	ND	ND	ND
TBA	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND
Vinyl acetate	ND	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND
m- & p-Xylenes	ND	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/Kg = micrograms per kilogram

TABLE 3

GROUNDWATER MONITORING AND PURGING DATA

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Well #	Date	Well Screen Interval (feet)	Ground Water Elevation (feet)	Depth to Ground Water (feet)	TOWC Elevation (feet)	Product Thickness (feet)	Sheen	Purged Water (gallons)	Purged Product (gallons)
MW-1	1/22/2014	5'-25'	170.00	5.22	175.22	0	No	3.0	NA
MW-1	10/4/2013		170.25	4.97	175.22	0	No	3.3	NA
MW-1	7/8/2013		170.70	4.52	175.22	0	No	10	NA
MW-1	4/10/2013		171.01	4.21	175.22	0	No	12	NA
MW-1	1/24/2013		171.06	4.16	175.22	0	No	30	NA
MW-2	1/22/2014	10'-35'	168.71	6.28	174.99	0	No	5.0	NA
MW-2	10/4/2013		168.86	6.13	174.99	0	No	4.7	NA
MW-2	7/8/2013		169.38	5.61	174.99	0	No	12	NA
MW-2	4/10/2013		170.09	4.90	174.99	0	No	20	NA
MW-2	1/24/2013		170.08	4.91	174.99	0	No	45	NA
MW-3	1/22/2014	5'-30'	166.51	8.23	174.74	0	No	3.5	NA
MW-3	10/4/2013		166.20	8.54	174.74	0	No	3.5	NA
MW-3	7/8/2013		167.05	7.69	174.74	0	No	12	NA
MW-3	4/10/2013		167.46	7.28	174.74	0	No	15	NA
MW-3	1/24/2013		171.24	3.50	174.74	0	No	20	NA
MW-4	1/22/2014	5'-25'	167.43	8.27	175.70	0	No	2.5	NA
MW-4	10/4/2013		167.49	8.21	175.70	0	No	2.7	NA
MW-4	7/8/2013		168.09	7.61	175.70	0	No	10	NA
MW-4	4/10/2013		169.09	6.61	175.70	0	No	12	NA
MW-4	1/24/2013		169.09	6.61	175.70	0	No	30	NA
MW-5	1/22/2014	5'-25'	157.07	5.75	162.82	0	No	12.5	NA
MW-5	10/4/2013		156.91	5.91	162.82	0	No	30	NA
MW-6	1/22/2014	5'-25'	159.89	7.81	167.70	0	No	12.0	NA
MW-6	10/4/2013		159.98	7.72	167.70	0	No	28	NA

NA = Not Applicable

TABLE 4a

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample Identification	Date	EPA 8015B		EPA 8260B										
		Oil Range Organics (mg/L)	Semi-Volatile Hydrocarbons (Diesel) (mg/L)	Volatile Hydrocarbons (Gasoline) (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-Benzene (ug/L)	o-Xylene (ug/L)	m-& p-Xylenes (ug/L)	MTBE (ug/L)	Ethyl-tert-butylether (ug/L)	Di-isopropylether (ug/L)	tert-amylmethylether (ug/L)	tert-Butylalcohol (ug/L)
MW-1	1/22/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	10/4/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	7/8/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	4/10/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	1/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2	1/22/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2	10/4/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2	7/8/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2	4/10/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2	1/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	1/22/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	10/4/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	7/8/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	4/10/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	1/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4	1/22/2014	ND	ND	2,830	491	23.9	47.4	35.4	49.0	ND	ND	ND	ND	ND
MW-4	10/4/2013	ND	ND	15,500	7,350	191	188	345	750	ND	ND	ND	ND	ND
MW-4	7/8/2013	ND	ND	7,100	2,880	148	107	141	347	ND	ND	ND	ND	ND
MW-4	4/10/2013	ND	ND	15,400	4,100	70.0	530	317	1,190	ND	ND	ND	ND	ND
MW-4	1/24/2013	ND	ND	8,110	5,500	576	309	403	240	ND	ND	ND	ND	ND

MTBE = Methyl-Tertiary-Butyl-Ether
ND = Not Detected at or above Reporting Limit
ug/L = micrograms per liter
mg/L = milligrams per liter

TABLE 4a

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample Identification	Date	EPA 8015B		EPA 8260B										
		Oil Range Organics (mg/L)	Semi-Volatile Hydrocarbons (Diesel) (mg/L)	Volatile Hydrocarbons (Gasoline) (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-Benzene (ug/L)	o-Xylene (ug/L)	m-& p-Xylenes (ug/L)	MTBE (ug/L)	Ethyl-tert-butylether (ug/L)	Di-isopropylether (ug/L)	tert-amylmethylether (ug/L)	tert-Butylalcohol (ug/L)
MW-5	1/22/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5	10/4/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6	1/22/2014	ND	ND	ND	ND	ND	ND	ND	ND	2.72	ND	ND	ND	ND
MW-6	10/4/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MTBE = Methyl-Tertiary-Butyl-Ether
ND = Not Detected at or above Reporting Limit
ug/L = micrograms per liter
mg/L = milligrams per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-1				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Acetone	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethylketone)	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND
Carbon tetrachloride(Tetrachloro methane)	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND
ETBE	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-1				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Hexachlorobutadiene (1,3-	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND
TAME	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND
TBA	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND
Vinyl acetate	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND
m- & p-Xylenes	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-2				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Acetone	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethylketone)	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND
Carbon tetrachloride(Tetrachloro methane)	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND
ETBE	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-2				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Hexachlorobutadiene (1,3-	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND
TAME	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND
TBA	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND
Vinyl acetate	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND
m- & p-Xylenes	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-3				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Acetone	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethylketone)	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND
Carbon tetrachloride(Tetrachloro methane)	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	6.82	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND
ETBE	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-3				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Hexachlorobutadiene (1,3-	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND
TAME	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND
TBA	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND
Vinyl acetate	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND
m- & p-Xylenes	ND	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-4				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Acetone	ND	ND	ND	ND	ND
Benzene	5,500	4,100	2,880	7,350	491
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethylketone)	ND	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND
Carbon tetrachloride(Tetrachloro methane)	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND	ND
DIPE	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	15.0
1,2-Dichloroethane	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND
ETBE	ND	ND	ND	ND	ND
Ethylbenzene	309	530	107	188	47.4

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID	MW-4				
Sample Date	1/24/2013	4/10/2013	7/8/2013	10/4/2013	1/22/2014
Organics	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Hexachlorobutadiene (1,3-	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND
Isopropylbenzene	ND	59.0	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND	ND
Naphthalene	ND	72.0	ND	ND	ND
n-Propylbenzene	ND	115	ND	ND	ND
TAME	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND
TBA	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	576	70.0	148	191	23.9
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	610	122	200	48.6
1,3,5-Trimethylbenzene	ND	182	ND	57.0	ND
Vinyl acetate	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND	ND
o-Xylene	403	317	141	345	35.4
m- & p-Xylenes	240	1,190	347	750	49.0

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID / Sample Date / Organics	MW-5 10/4/2013 (µg/L)	MW-5 1/22/2014 (µg/L)	MW-6 10/4/2013 (µg/L)	MW-6 1/22/2014 (µg/L)
Acetone	ND	ND	ND	ND
Benzene	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
Bromoform (Tribromomethane)	ND	ND	ND	ND
Bromomethane (Methyl bromide)	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethylketone)	ND	ND	ND	ND
n-Butylbenzene	ND	ND	ND	ND
sec-Butylbenzene	ND	ND	ND	ND
tert-Butylbenzene	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND
Carbon tetrachloride(Tetrachloro methane)	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND
Chloroform (Trichloromethane)	ND	ND	ND	ND
Chloromethane (Methyl chloride)	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	ND	ND	ND	ND
DIPE	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND
ETBE	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

TABLE 4b

ANALYTICAL LABORATORY RESULTS FOR GROUNDWATER SAMPLES

Commercial Property
4311 - 4333 MacArthur Boulevard, Oakland, California

Sample ID / Sample Date / Organics	MW-5 10/4/2013 (µg/L)	MW-5 1/22/2014 (µg/L)	MW-6 10/4/2013 (µg/L)	MW-6 1/22/2014 (µg/L)
Hexachlorobutadiene (1,3-	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	ND	ND	ND	ND
MTBE	ND	ND	ND	2.72
4-Methyl-2-pentanone (MIBK, Methyl isobutyl	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND
TAME	ND	ND	ND	ND
Styrene	ND	ND	ND	ND
TBA	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	ND	ND	ND	ND
Toluene (Methyl benzene)	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND
Vinyl acetate	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND
m- & p-Xylenes	ND	ND	ND	ND

ND = Not Detected at/above reporting limit
µg/L = micrograms per liter

APPENDIX C

(TABLES 1 AND 2)

TABLE 1

SOIL REMEDIATION ESTIMATED COSTS

Commercial Property
4311 – 4333 MacArthur Boulevard
Oakland, California

EXCAVATE AND DISPOSE (Estimated Cost: $37,500 - $50,000)

- Excavate and dispose of 250 to 300 tons of subsurface contaminated soil.
- Work to include subsurface assessment and soil disposal profiling, sampling, coordination and project management work; excavation to access area of contamination; load, transport and dispose contaminated soil; backfill all excavated areas; and prepare a summary report of the assessment and remediation work performed.

SOIL VAPOR EXTRACTION (Estimated Cost: $125,000 - $250,000)

- Implement subsurface soil remediation by vapor extraction.
- Work to include preparation of remedial action plan, design of vapor extraction system, obtain permits and pay fees, vapor extraction well installation (three to five wells), system installation on site, rental of vapor extraction equipment (six to 12 months), Operation and Maintenance of vapor extraction equipment (six to 12 months), abandon vapor extraction wells, and preparation of quarterly soil vapor extraction reports (two to four quarterly reports.

TABLE 2

GROUNDWATER REMEDIATION ESTIMATED COSTS

Commercial Property
4311 – 4333 MacArthur Boulevard
Oakland, California

GROUNDWATER EXTRACTION AND TREATMENT
(Estimated Cost: $175,000 - $325,000)

- Implement groundwater remediation by extraction and treatment of groundwater from the subsurface contaminated areas on site.
- Work to include preparation of remedial action plan, design of extraction and treatment system, obtain permits and pay fees, groundwater extraction well installation (three to five wells), extraction and treatment system installation, Operation and Maintenance of the extraction and treatment system, abandon extraction wells, and preparation of quarterly groundwater remediation summary reports (four to eight quarterly reports).

AIR SPARGING (Estimated Cost: $125,000 - $240,000)

- Implement groundwater remediation by air sparging in the subsurface contaminated areas on site.
- Work to include preparation of remedial action plan, design of the air sparging system, obtain permits and pay fees, vapor extraction well and air sparge probe installation (three to five wells and probes), system installation on site, rental of air sparging equipment (six to 12 months), Operation and Maintenance of air sparge equipment (six to 12 months), abandon vapor extraction wells and air sparge probes, and preparation of quarterly groundwater remediation reports (two to four quarterly reports).

IN-SITU MODIFIED OXIDATION (Estimated Cost: $25,000 - $40,000)

- Implement groundwater remediation by in-situ modified oxidation in the subsurface contaminated areas on site.
- Work to include extraction and disposal of exposed groundwater from the excavation cavity, application of Oxygen Release Compound (ORC) Advanced™ /reagents, and monitor application. Application work on site to be implemented in a period of two to four weeks, followed by quarterly monitoring and sampling of groundwater monitoring wells.
- Work will also include the necessary excavation and backfilling work to implement this method of remediation. However, the costs for such work are not included in this portion of the estimated costs since they are included in the soil remediation costs estimated in Appendix C, Table 1.

APPENDIX D

(OXYGEN RELEASE COMPOUND (ORC) ADVANCED™ CALCULATIONS)

ORC Advanced™ Application Calculation	
Design Features	**Specifications**
Treatment (Excavation) Area	30 ft. X 30 ft. = 900 sq. ft.
Thickness Requiring Treatment	6 ft. (8 ft. to 14 ft.)
ORC Dose Rate (% Weight of ORC to Weight of Soil)	0.2% - Backfill Material (8 ft. to 10 ft. = 2 ft.) 0.5% - GW/Saturated Zone (10 ft. to 14 ft. = 4ft.)
Soil Density	120 lbs / cu. ft.
ORC Requirement	0.002x900x2x120 = 432 lbs. ORC 0.005x900x4x120 = 2,160 lbs. ORC **TOTAL ORC = 432 + 2,160 = 2,592 lbs.**

APPENDIX E

(PRODUCT SPECIFICATION BROCHURE AND MATERIAL SAFETY DATA SHEET (MSDS) FOR ORC ADVANCED™)

REGENESIS

ORC ADVANCED® OXYGEN RELEASE COMPOUND

Highest amount of active oxygen in a controlled-release, oxygen producing compound

PRODUCT OVERVIEW

ORC Advanced® is the state-of-the-art technology for stimulating aerobic bioremediation. It offers unparalleled, maximum oxygen release for periods up to 12 months on a single injection and is specifically designed to minimize oxygen waste while maximizing contaminated site remediation.

ORC Advanced is a formulation of calcium oxyhydroxide which, upon hydration, releases oxygen and forms simple calcium hydroxide and water.

$$CaO(OH)_2 + H_2O \longrightarrow \tfrac{1}{2}O_2 + Ca(OH)_2 + H_2O$$

PRODUCT BENEFITS

PRODUCT BENEFITS

HIGHEST AVAILABLE OXYGEN CONTENT

More active oxygen (17%) plus Regenesis' patented controlled-release technology (CRT™) saves time and money by increasing degradation rates and improving remediation performance by providing more oxygen on a single injection. It is particularly effective at higher demand sites where oxygen may be limited and scavenged by competing carbon sources.

PATENTED CONTROLLED-RELEASE TECHNOLOGY (CRT™)

Based on the same proven technology employed in the industry standard Oxygen Release Compound (ORC®), CRT allows for an efficient, long-term release of oxygen providing the optimal conditions for sustained aerobic biodegradation. This can save time and money by reducing the potential need for multiple applications. Also, oxygen release "lock-up" is avoided – an unfortunate problem experienced with commodity chemicals.

IN SITU APPLICATION

Remediation with ORC Advanced is typically more cost-effective than *ex situ* treatments. With the use of ORC Advanced there is minimal site disturbance with no above-ground piping or mechanical equipment, no operations and maintenance costs and no hazardous materials handling or disposal.

CRT

DEFINING THE SCIENCE BEHIND CONTROLLED-RELEASE TECHNOLOGY (CRT™)

Early on, Regenesis researchers noted that in order to optimally stimulate the natural attenuation of aerobically degradable contaminants, biologically usable oxygen was best supplied in low but constant concentrations. Big bursts of oxygen are wasteful and simply "bubble off", often generating undesirable foaming and producing unwanted preferential flow paths in the subsurface. Regenesis sought to solve this problem by controlling the rate of oxygen release from solid oxygen sources.

The answer was provided by the development of CRT. The CRT process involves intercalating (embedding) phosphates into the crystal structure of solid peroxygen molecules. This patented feature, now available in the ORC Advanced® formulation, slows the reaction that yields oxygen within the crystal, minimizing "bubble off" which can waste the majority of oxygen available in common solid peroxygen chemicals.

FIGURE 1:
FILLING A PUMP WITH ORC ADVANCED SLURRY

CRT provides "balance" – it slows down the rate of oxygen release while at the same time preventing "lock-up". Commodity solid peroxygen chemicals, when in contact with water, will produce an initial rapid and uncontrolled-release of oxygen. Then, as hydroxides form, a significant portion of the oxygen deeper in the crystal is made unavailable or becomes"locked-up." This undesirable effect is inefficient and costly. CRT prevents lock up and controls the rate of oxygen release, representing the state-of-the-art technology in passive oxygen delivery.

1011 Calle Sombra San Clemente California 92673-6244 Telephone: 949.366.8000 Fax: 949.366.8090 www.regenesis.com

REGENESIS

The original controlled-release oxygen compound, since 1994

ORC® OXYGEN RELEASE COMPOUND

PRODUCT OVERVIEW

The original Oxygen Release Compound (ORC®) is a fine, powdery material comprised of a patented formulation of phosphate-intercalated magnesium peroxide. The intercalation or embedding of phosphates within the magnesium peroxide is Regenesis' patented, controlled-release mechanism.

Upon hydration, ORC is designed to produce a controlled-release of oxygen (10% by weight) into the subsurface in accordance with the following reaction:

$$MgO_2 + H_2O \longrightarrow \tfrac{1}{2}O_2 + Mg(OH)_2$$

This process can proceed for periods of up to one year depending on site conditions. In the presence of this long-lasting oxygen source, aerobic microbes flourish - accelerating the naturally slow rates of aerobic biodegradation.

BENEFITS

PRODUCT BENEFITS

By enhancing bioremediation using ORC, in situ treatment of contaminants can result in an efficient, simple and cost-effective alternative to traditional technologies. With low capital costs, no operations and maintenance, minimal site disturbance and proven effectiveness, ORC can restore water quality and property values at a reasonable cost.

PRODUCT APPLICATION

MATERIAL APPLICATION

Most contaminated sites are treated using ORC slurry which is a prescribed and easily injectable water and ORC mixture (Figure 2). The direct - injection of ORC slurry maximizes ORC and oxygen distribution in the subsurface increasing the range of enhanced biodegradation. ORC is dosed in pounds per vertical foot of material treated. The amount of ORC recommended depends greatly on various factors such as contaminant concentrations, oxygen sinks, groundwater flow rates and subsurface geology. It is recommended that a Regenesis Technical Services Representative be contacted for detailed design information.

ORC treatment approaches or designs may consist of one, or combinations of the following: Source Area Grids, Plume Area Grids or Barriers, Excavations and Biopiles.

SUBSURFACE EMPLACEMENT

- Direct – Push Injection
- Hollow Stem Augers
- Existing Wells
- Recirculating Wells
- Replaceable Filter Socks (existing wells)
- Excavations
- Trenches

CONTAMINANTS

TREATABLE CONTAMINANTS

ORC can treat a wide range of contaminants and most any aerobically degradable compound including: gasoline and fuel additives (BTEX and MTBE), diesel, kerosene, jet fuel, gas condensates, fuel oils, lubricants, bunker oil, PAHs, certain metals (arsenic), certain pesticides/herbicides and certain industrial solvents (alcohols and ketones).

FIGURE 2: ORC SLURRY

1011 Calle Sombra San Clemente California 92673-6244 Telephone: 949.366.8000 Fax: 949.366.8090 www.regenesis.com

REGENESIS

Oxygen Release Compound (ORC®) Installation Instructions

(Excavation Applications)

SAFETY:

Pure ORC is shipped to you as a fine powder, which is rated at -325 mesh (passes through a 44 micron screen). It is considered to be a mild oxidizer and as such should be handled with care while in the field. Field personnel should take precautions while applying the pure ORC. Typically, the operator should work up wind of the product as well as use appropriate safety equipment. These would include eye, respiratory protection and gloves as deemed appropriate by exposure duration and field conditions.

Although two options are discussed, application of ORC should never be applied by personnel within the tank excavation, unless proper shoring or sidewall cutback is in place.

GENERAL GUIDELINES:

ORC can be applied in a dry powder form or as a slurry. Field conditions dictate which form of ORC can be used most effectively.

Installation of ORC should be within the tank excavation floor and/or in an adequate backfill section thickness to account for the anticipated groundwater "smear zone".

Maximum treatment effect is obtained when ORC is mixed as thoroughly as possible within the backfill material. The more dispersed the ORC slurry/powder within the excavation backfill, the more effective the treatment.

The quantity of ORC to be used is generally calculated prior to moving into the field for installation. Generally it is applied at a rate of between 0.1% and 1.0% by weight of the soil matrix. The following illustrates a dilute application rate calculation:

> Use a weight/weight percent of ORC/backfill material to ensure distribution of the ORC into the desired aquifer section. For example: a 0.15% weight of ORC to weight of backfill for the standard ORC weight (30 pounds) per container calculates as follows: 30 lb. ORC/0.15% = 20,000 lbs. of soil matrix. Thus, to achieve a 0.15% mixture of ORC in the backfill material, 30 lb. of pure ORC should be mixed into 10 tons (20,000 lbs. ÷2,000 lbs./ton) of backfill, or approximately 7 - 10 cubic yards of soil depending on field conditions. Professional judgment should be used to select the appropriate soil mass per cubic yard for designing each site treatment.

CHOOSING THE FORM OF INSTALLATION:

Pure ORC is shipped to you in a powder form. Weather conditions (especially wind) may have a direct effect on the application of ORC as a tank backfill amendment.

Application of the dry powder may be difficult in windy conditions. To counter the effects of wind (and the subsequent potential loss of ORC), Regenesis recommends that a water source or a spray tank be on-site to wet down the ORC and the backfill material as ORC is applied.

Application of ORC in a slurry format is a very effective method and eliminates the wind issue.

Four somewhat different installation conditions can be encountered in the field:

- ORC in a pea gravel back-fill. ("Type 1")
- ORC in a soil back-fill. ("Type 2")
- ORC mixed in native soil in the bottom of a tank pit. ("Type 3")
- ORC installed in soil under standing water in the bottom of a tank pit. ("Type 4")

A single tank pit excavation can include more than one of these conditions, depending on the site and extent of treatment. Instructions for each condition are discussed separately in the following sections. After the installation instructions are detailed instructions for mixing the slurry, if that is the option chosen.

INSTALLATION INSTRUCTIONS:

"Type 1," ORC in a Pea Gravel Back-fill

The easiest method for installing ORC in pea gravel back-fill is to mix the ORC in the material in a backhoe or skiploader bucket before placing it in the excavation.

- **Dry Powder method**

Into each scoop of back-fill material add the appropriate portion of ORC being installed. Generally, it is advisable to moisten the material in the bucket to reduce wind blown ORC loss. Excessive winds make this method not feasible.

After mixing the dry powder in the bucket, it is dumped into the bottom of the excavation. The backhoe bucket can be used for further mixing in the excavation.

- **Slurry method**

Mix a 63% solids slurry of ORC and water (see "Steps to make ORC slurry). This relatively thick slurry is used to help keep the ORC dispersed through the pea gravel, even when it contacts water in the bottom of the excavation during installation. It is generally desirable to avoid having the ORC run down through the pea gravel and collect in the bottom of the excavation. The thick slurry addresses this issue.

In each scoop of back-fill material, add the appropriate amount of ORC slurry. Pre-mix the materials in the backhoe bucket After mixing, dump the slurry and back-fill into the bottom of the excavation. The backhoe bucket can be used for further mixing in the

excavation.

If the slurry method is being used, observe the physical behavior of the ORC in the fill material. If the ORC collects at the bottom of the back-fill material, increase the percent solids content by reducing the amount of water being used to make the slurry.

"Type 2," ORC in a Soil Back-fill

Follow the instructions for the pea gravel back-fill method, except:

If the slurry method is being used, the solids content should be reduced. Typically a 50% solids is appropriate, although soil conditions sometimes dictate lower solids contents (see "Steps to make ORC slurry").

" Type 3," ORC Mixed in Native Soil in the Bottom of the Tank Pit

When ORC is added to the bottom of a tank pit it may be done by backhoe or injection.
CAUTION: Personnel should never work within the tank excavation, unless proper shoring or sidewall cutback is in place.

- **Backhoe method**

A skilled backhoe operator can distribute the ORC around the bottom of the tank excavation and, using the bucket, mix it thoroughly. If there are no winds, it may be possible to:

1. Put the dry ORC powder in the backhoe bucket,
2. Lower it to the bottom of the pit,
3. Gently deposit the ORC evenly on the remaining soil,
4. Use the bucket to mix the powder into the soil,
5. To mitigate dusting, if necessary, spray water into the excavation during the process.

An alternative backhoe method is to use a 50% (or less) solids ORC slurry (see "Steps to make ORC slurry) in place of the dry powder. This eliminates the dusting problem, and in some cases enhances the even distribution of ORC into the soil. Observe the slurry mixing behavior in the bottom of the excavation, and adjust the water content of the slurry to optimize mixing, if necessary.

- **Injection method**

If available, a pump and root feeder may be used to inject an ORC slurry into the excavation floor. This may require a more dilute slurry mix, and care should be taken to assure that the solids do not settle out of the slurry prior to injection.

" Type 4." ORC installed in standing water in the bottom of a tank pit

Application of ORC into tank excavations with standing water requires the operator apply ORC in a slurry form. ORC powder application in this scenario is not advised because a portion of the ORC particle fraction is not likely to pass through the surface tension of the standing water. Caution: Personnel should never work within the tank excavation, unless proper shoring or sidewall cutback is in place.

- **Backhoe method**

A skilled backhoe operator can distribute the ORC slurry within the excavation, and mix it into the soil underlying the standing water with the bucket. Steps for installation:

1. Mix a high solids content ORC slurry (63% solids). See ("Steps to make ORC slurry").
2. Pour slurry into the backhoe bucket.
3. Lower the bucket to the standing water level in the excavation, and deposit the slurry as evenly as possible across the excavation floor. The dense slurry (63%solids is 1.6 grams per ml) will tend to make the majority of the slurry sink quickly to the bottom of the water layer.
4. Use the bucket to mix the slurry into the soil.
5. Water in the vicinity of the ORC slurry will often turn white and milky, since some of the ORC is dispersed within the standing water. This provides additional dispersion within the standing water and back-fill material as it is added to the excavation.

- **Injection method**

If available, a pump and root feeder may be used to inject an ORC slurry into the soil in an excavation. This may require a more dilute slurry mix, and care should be taken to assure that the solids do not settle out of the slurry prior to injection.

MIXING ORC SLURRY:

ORC powder is shipped to you in pre-measured batches. Each batch is contained in a plastic bag which is shipped in a 5-gallon bucket.

Remove the pre-measured ORC bag from the 5-gallon bucket and open
Measure and pour the appropriate amount of water from the following table into the 5 gallon bucket

Slurry Solids Content (%)	Pounds of ORC	Gallons of Water
63%	30 lbs.	2.1 gal. (2 gal. + 2 cups)
50%	30 lbs.	3.6 gal. (3 gal + 2 1/2 qts.)

Add the entire ORC pre-measured bag to the water (30 pounds). If the slurry solids contents of less than 50% are desired, the quantity of ORC per batch mixed in the bucket must be reduced. For example, a bucket containing four gallons of water would require 22.4 pounds of ORC to make a 40% solids slurry, and 16.6 pounds of ORC to make a 33% slurry.

Use an appropriate mixing device to thoroughly mix ORC and water. Regenesis

recommends use of a 0.5 Horsepower (minimum) hand held drill with a "jiffy mixer" or stucco mixer. A common paint paddle can be used to scrape the bottom and sides of the container to ensure thorough mixing. Standard environmental slurry mixers may also be used.

After mixing, small amounts of water can be added to adjust the consistency of the slurry.

When slurries are used, the early batches should be observed in the process of mixing with the soil. Each site can vary, due to soil type and moisture content. Based on professional judgment, additional water can be added to subsequent slurry batches.

ORC slurry should be used ASAP; if the ORC slurry has been standing more than 15 minutes, it should be remixed immediately before using. Do not let stand more than 30 minutes without stirring. Otherwise, the slurry will begin to harden into a weak cement.

For direct assistance or answers to any questions you may have regarding these instructions, contact Regenesis Technical Services at 949-366-8000.

REGENESIS, 2002
www.regenesis.com

Oxygen Release Compound – Advanced (ORC *Advanced*™)
MATERIAL SAFETY DATA SHEET (MSDS)

Last Revised: October 30, 2013

Section 1 - Material Identification

Supplier:

REGENESIS

1011 Calle Sombra
San Clemente, CA 92673

Phone:	**949.366.8000**
Fax:	**949.366.8090**
E-mail:	**info@regenesis.com**

Chemical Description:	A mixture of Calcium OxyHydroxide [$CaO(OH)_2$] and Calcium Hydroxide [$Ca(OH)_2$].
Chemical Family:	Inorganic Chemical
Trade Name:	Advanced Formula Oxygen Release Compound (ORC *Advanced*™)
Chemical Synonyms	Calcium Hydroxide Oxide; Calcium Oxide Peroxide; Calcium Oxy-Hydroxide; Calcium Oxyhydroxide
Product Use:	Used to remediate contaminated soil and groundwater (environmental applications)

Section 2 – Composition

CAS No.	Chemical
682334-66-3	**Calcium Hydroxide Oxide [$CaO(OH)_2$]**
1305-62-0	**Calcium Hydroxide [$Ca(OH)_2$]**
7758-11-4	**Dipotassium Phosphate (HK_2O_4P)**
7778-77-0	**Monopotassium Phosphate (H_2KO_4P)**

Section 3 – Physical Data	
Form:	Powder
Color:	White to Pale Yellow
Odor:	Odorless
Melting Point:	527 °F (275 °C) – Decomposes
Boiling Point:	Not Applicable (NA)
Flammability/Flash Point:	NA
Auto- Flammability:	NA
Vapor Pressure:	NA
Self-Ignition Temperature:	NA
Thermal Decomposition:	527 °F (275 °C) – Decomposes
Bulk Density:	0.5 – 0.65 g/ml (Loose Method)
Solubility:	1.65 g/L @ 68° F (20° C) for calcium hydroxide.
Viscosity:	NA
pH:	11-13 (saturated solution)
Explosion Limits % by Volume:	Non-explosive
Hazardous Decomposition Products:	Oxygen, Hydrogen Peroxide, Steam, and Heat
Hazardous Reactions:	None

Section 4 – Reactivity Data

Stability:	Stable under certain conditions (see below).
Conditions to Avoid:	Heat and moisture.
Incompatibility:	Acids, bases, salts of heavy metals, reducing agents, and flammable substances.
Hazardous Polymerization:	Does not occur.

Section 5 – Regulations

TSCA Inventory List:	Listed

CERCLA Hazardous Substance (40 CFR Part 302)

Listed Substance:	No
Unlisted Substance:	Yes
Reportable Quantity (RQ):	100 pounds
Characteristic(s):	Ignitibility
RCRA Waste Number:	D001

SARA, Title III, Sections 302/303 (40 CFR Part 355 – Emergency Planning and Notification)

Extremely Hazardous Substance:	No

SARA, Title III, Sections 311/312 (40 CFR Part 370 – Hazardous Chemical Reporting: Community Right-To-Know

Hazard Category:	Immediate Health Hazard Fire Hazard
Threshold Planning Quantity:	10,000 pounds

Section 5 – Regulations (cont)

SARA, Title III, Section 313 (40 CFR Part 372 – Toxic Chemical Release Reporting: Community Right-To-Know

Extremely Hazardous Substance:	No	
WHMIS Classification:	C	Oxidizing Material Poisonous and Infectious Material
	D	Material Causing Other Toxic Effects – Eye and Skin Irritant
Canadian Domestic Substance List:	Not Listed	

Section 6 – Protective Measures, Storage and Handling

Technical Protective Measures

Storage:	Keep in tightly closed container. Store in dry area, protected from heat sources and direct sunlight.
Handling:	Clean and dry processing pipes and equipment before operation. Never return unused product to the storage container. Keep away from incompatible products. Containers and equipment used to handle this product should be used exclusively for this material. Avoid contact with water or humidity.

Section 6 – Protective Measures, Storage and Handling (cont)

Personal Protective Equipment (PPE)

Engineering Controls:	Calcium Hydroxide ACGIH® TLV® (2000) 5 mg/m^3 TWA OSHA PEL Total dust–15 mg/m^3 TWA Respirable fraction– 5 mg/m^3 TWA NIOSH REL (1994) 5 mg/m^3
Respiratory Protection:	For many conditions, no respiratory protection may be needed; however, in dusty or unknown atmospheres use a NIOSH approved dust respirator.
Hand Protection:	Impervious protective gloves made of nitrile, natural rubbber or neoprene.
Eye Protection:	Use chemical safety goggles (dust proof).
Skin Protection:	For brief contact, few precautions other than clean clothing are needed. Full body clothing impervious to this material should be used during prolonged exposure.
Other:	Safety shower and eyewash stations should be present. Consultation with an industrial hygienist or safety manager for the selection of PPE suitable for working conditions is suggested.
Industrial Hygiene:	Avoid contact with skin and eyes.
Protection Against Fire & Explosion:	NA

Section 7 – Hazards Identification

Emergency Overview:	Oxidizer – Contact with combustibles may cause a fire. This material decomposes and releases oxygen in a fire. The additional oxygen may intensify the fire.
Potential Health Effects:	Irritating to the mucous membrane and eyes. If the product splashes in ones face and eyes, treat the eyes first. Do not dry soiled clothing close to an open flame or heat source. Any

	clothing that has been contaminated with this product should be submerged in water prior to drying.
Inhalation:	High concentrations may cause slight nose and throat irritation with a cough. There is risk of sore throat and nose bleeds if one is exposed to this material for an extended period of time.
Eye Contact:	Severe eye irritation with watering and redness. There is also the risk of serious and/or permanent eye lesions.
Skin Contact:	Irritation may occur if one is exposed to this material for extended periods.
Ingestion:	Irritation of the mouth and throat with nausea and vomiting.

Section 8 – Measures in Case of Accidents and Fire

After Spillage/Leakage/Gas Leakage:	Collect in suitable containers. Wash remainder with copious quantities of water.
Extinguishing Media:	See next.
Suitable:	Large quantities of water or water spray. In case of fire in close proximity, all means of extinguishing are acceptable.
Further Information:	Self contained breathing apparatus or approved gas mask should be worn due to small particle size. Use extinguishing media appropriate for surrounding fire. Apply cooling water to sides of transport or storage vessels that are exposed to flames until the fire is extinguished. Do not approach hot vessels that contain this product.
First Aid:	After contact with skin, wash immediately with plenty of water and soap. In case of contact with eyes, rinse immediately with plenty of water and seek medical attention. Consult an opthalmologist in all cases.

Section 8 – Measures in Case of Accidents and Fire

Eye Contact:	Flush eyes with running water for 15 minutes, while keeping the eyelids wide open. Consult with an ophthalmologist in all cases.
Inhalation:	Remove subject from dusty environment. Consult with a physician in case of respiratory symptoms.

Ingestion:	If the victim is conscious, rinse mouth and admnister fresh water. DO NOT induce vomiting. Consult a physician in all cases.
Skin Contact:	Wash affected skin with running water. Remove and clean clothing. Consult with a physician in case of persistent pain or redness.
Special Precautions:	Evacuate all non-essential personnel. Intervention should only be done by capable personnel that are trained and aware of the hazards associated with this product. When it is safe, unaffected product should be moved to safe area.
Specific Hazards:	Oxidizing substance. Oxygen released on exothermic decomposition may support combustion. Confined spaces and/or containers may be subject to increased pressure. If product comes into contact with flammables, fire or explosion may occur.

Section 9 – Accidental Release Measures

Precautions:	Observe the protection methods cited in Section 3. Avoid materials and products that are incompatible with product. Immediately notify the appropriate authorities in case of reportable discharge (> 100 lbs).
Cleanup Methods:	Collect the product with a suitable means of avoiding dust formation. All receiving equipment should be clean, vented, dry, labeled and made of material that this product is compatible with. Because of the contamination risk, the collected material should be kept in a safe isolated place. Use large quantities of water to clean the impacted area. See Section 12 for disposal methods.

Section 10 – Information on Toxicology

Toxicity Data

Acute Toxicity:	Oral Route, LD_{50}, rat, > 2,000 mg/kg (powder 50%) Dermal Route, LD_{50}, rat, > 2,000 mg/kg (powder 50%) Inhalation, LD_{50}, rat, > 5,000 mg/m^3 (powder 35%)
Irritation:	Rabbit (eyes), severe irritant

Sensitization:	No data
Chronic Toxicity:	In vitro, no mutagenic effect (Powder 50%)
Target Organ Effects:	Eyes and respiratory passages.

Section 11 – Information on Ecology

Ecology Data	
	10 mg $Ca(OH)_2$/L: pH = 9.0 100 mg $Ca(OH)_2$/L: pH = 10.6
Acute Exotoxicity:	Fishes, Cyprinus carpio, LC_{50}, 48 hrs, 160 mg/L Crustaceans, Daphnia sp., EC_{50}, 24 hours, 25.6 mg/L (Powder 16%)
Mobility:	Low Solubility and Mobility
Abiotic Degradation:	Water – Slow Hydrolysis. Degradation Products: Calcium Hydroxide Water/soil – complexation/precipitation. Carbonates/sulfates present at environmental concentrations. Degradation products: carbonates/sulfates sparingly soluble
Biotic Degradation:	NA (inorganic compound)
Potential for Bioaccumulation:	NA (ionizable inorganic compound)

Section 11 – Information on Ecology (cont)

Comments:	Observed effects are related to alkaline properties of the product. Hazard for the environment is limited due to the product properties of: • No bioaccumulation • Weak solubility and precipitation as carbonate or sulfate in an aquatic environment. Diluted product is rapidly neutralized at environmental pH.
Further Information:	NA

Section 12 – Disposal Considerations

Waste Disposal Method:	Consult current federal, state and local regulations regarding the proper disposal of this material and its emptied containers.

Section 13 – Shipping/Transport Information

D.O.T Shipping Name:	Oxidizing Solid, N.O.S [A mixture of Calcium OxyHydroxide [$CaO(OH)_2$] and Calcium Hydroxide [$Ca(OH)_2$].
UN Number:	1479
Hazard Class:	5.1
Label(s):	5.1 (Oxidizer)
Packaging Group:	II
STCC Number:	4918717

Section 14 – Other Information

HMIS® Rating	Health – 2 Flammability – 0	Reactivity – 1 PPE - Required

HMIS® is a registered trademark of the National Painting and Coating Association.

NFPA® Rating	Health – 2 Flammability – 0	Reactivity – 1 OX

NFPA® is a registered trademark of the National Fire Protection Association.

Reason for Issue: Update toxicological and ecological data

Section 15 – Further Information

The information contained in this document is the best available to the supplier at the time of writing, but is provided without warranty of any kind. Some possible hazards have been determined by analogy to similar classes of material. The items in this document are subject to change and clarification as more information become available.