**MATRIX Engineering, Inc.**
170 Highway 35, Red Bank, NJ 07701 Phone: (732) 747-9111 Fax: (732) 741-5553

August 26, 1998

Mr. William Brown
NJDEP - BUST
PO Box 433
401 East State Street
Trenton, NJ 08625

Re: Allied Building Supply
101 West Elizabeth Avenue
Linden, NJ
Case No. 93-06-24-1425

Dear Sir:

Presented herein is an application for a Classification Exception Area for the property located at 101 West Elizabeth Avenue, Linden, NJ. Attached are analytical data, calculations and drawings to support this application. These attachments include historical analytical data on the monitoring wells on this site, a drawing which displays the historical groundwater gradient on the site, and the results of the modeling calculations to predict the fate and transport of BTEX at this site. The data and modeling predict a very slow rate of transport of the contaminants and does not predict that potential receptors will be impacted.

This site had a discharge from an underground gasoline storage tank and/or piping prior to 1993. A total of six groundwater monitoring wells have been installed on or near this site as part of the site investigation. Through the eight rounds of sampling which has occurred over the past five years, only MW#1 has indicated contaminants at levels above the applicable Groundwater Quality Standards. Furthermore, the level of these contaminants have been significantly reduced over this period through natural processes.

It has been reported that a well search was previously performed in support of the management of this case and the results were submitted to the NJDEP. This well search indicated no downgradient wells to be within ¼ miles of the site.

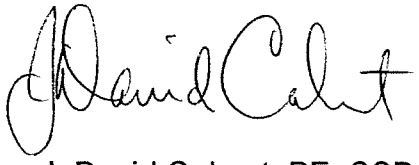
The direction of groundwater flow is indicated to be toward the east. The closest potential receptor in this direction is the storm sewer collection system which is located in the parking lot for the Linden Rail Station. This system is approximately 75 feet from the property line of this site.

The native soils at this site are have been characterized as a silty clay during well installations. Based on this characterization, the hydraulic conductivity at this site has been estimated to be approximately 3E-3 ft/day. Groundwater elevations have been measured in the various monitoring wells during each sampling episode. These data indicate that the groundwater gradient is approximately 0.005 ft/ft (See Figure 1). The porosity of the silty clay soils has been estimated to be <0.5. Based on the foregoing data, the actual groundwater flow rate is calculated to be 3E-5 ft/day. At this flow rate, the plume is predicted to be essentially stagnant. Even using other more conservative assumptions, the maximum distance for the migration of the BTEX plume is predicted to be less than 15 feet from the source located at or near MW#1. Therefore, the plume is predicted not to impact receptors and is predicted not to travel beyond the limits of the property boundary.

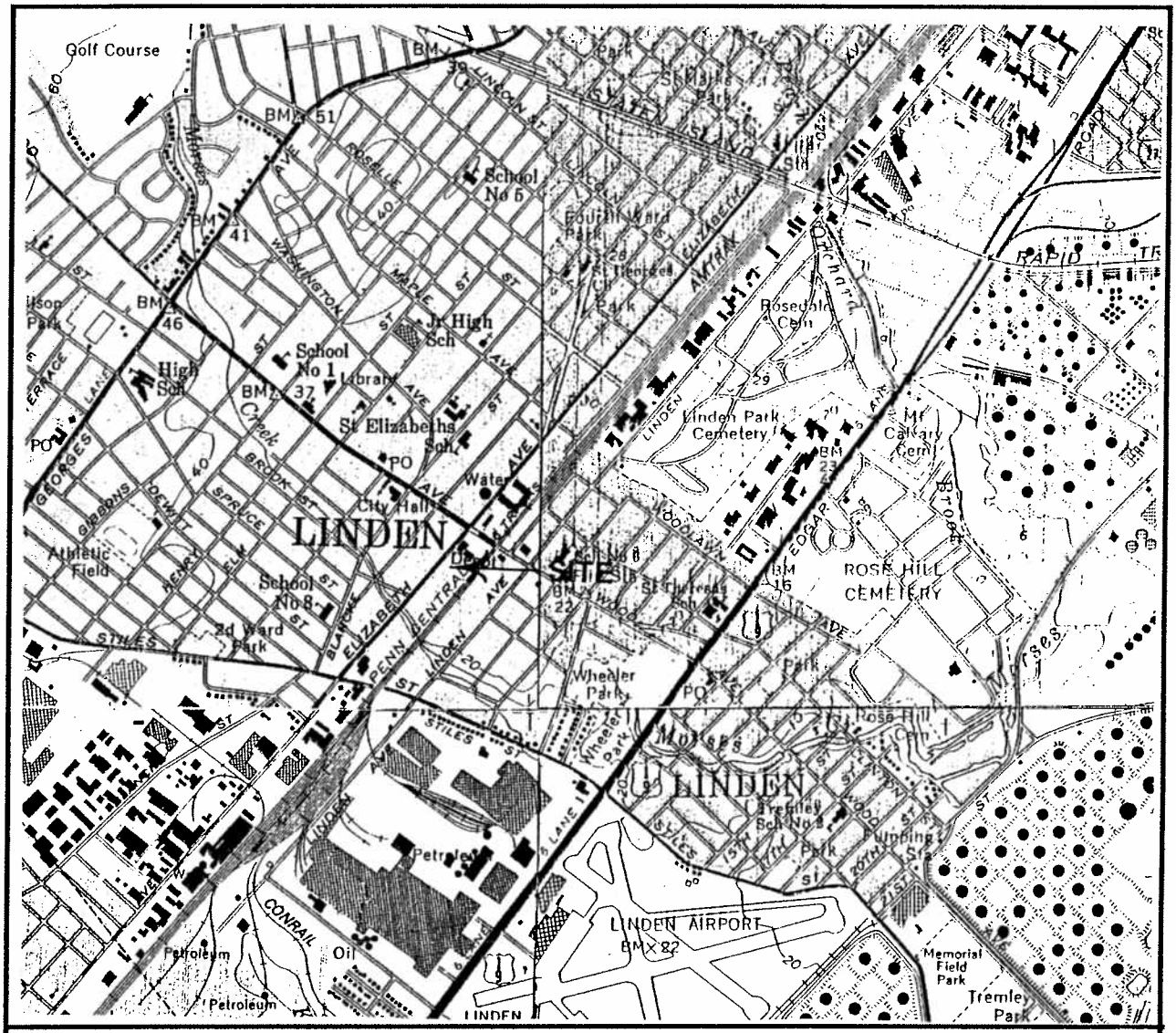
Based on these analyses, a Classification Exception Area is proposed for this site to the limits of the property boundaries.

Thank you for your consideration. If you have any questions on this matter, please contact me at your convenience.

Very truly yours,



J. David Calvert, PE, CSP
For Matrix Engineering, Inc.




Drawing from USGS Maps
Roselle Quadrangle
Elizabeth Quadrangle
Perth Amboy Quadrangle
Arthur Kill Quadrangle

Allied Building Supply
101 W. Elizabeth Avenue
Linden
Union
New Jersey

Scale 1:24000

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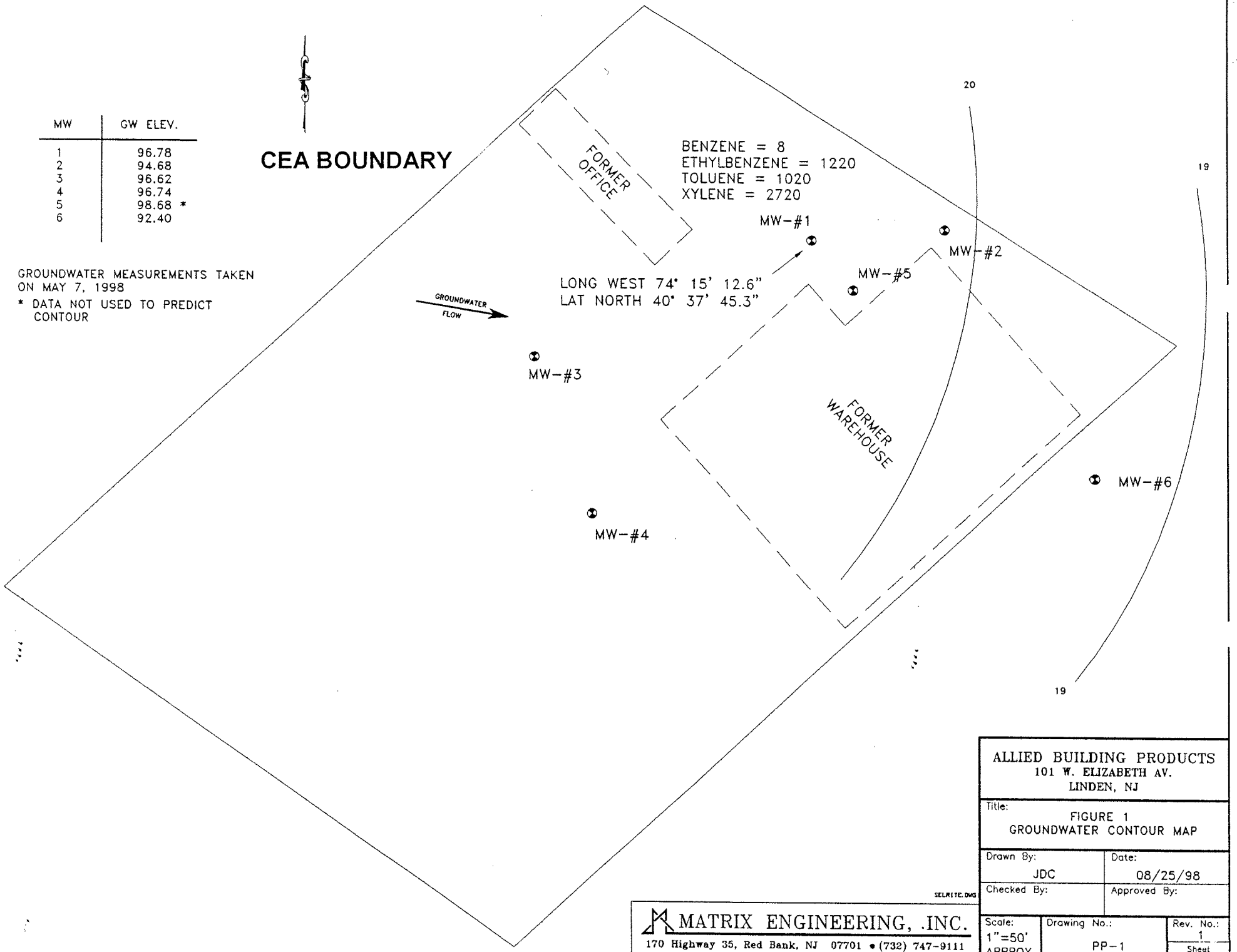
Figure 2
USGS
August 26, 1998

| MW | GW ELEV. |
|---|---|
| 1 | 96.78 |
| 2 | 94.68 |
| 3 | 96.62 |
| 4 | 96.74 |
| 5 | 98.68 * |
| 6 | 92.40 |

GROUNDWATER MEASUREMENTS TAKEN ON MAY 7, 1998

* DATA NOT USED TO PREDICT CONTOUR




ALLIED BUILDING PRODUCTS
101 W. ELIZABETH AV.
LINDEN, NJ

Title: FIGURE 1
GROUNDWATER CONTOUR MAP

| Drawn By: | Date: |
|---|---|
| JDC | 08/25/98 |
| Checked By: | Approved By: |

SELRITE.DWG

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| Scale: | Drawing No.: | Rev. No.: |
|---|---|---|
| 1"=50' APPROX. | PP-1 | 1 |

Sheet 1 of 1

TABLE 1
Allied Building Supply Site
Field Determined Well Parameters
Measured Before Purging
5/7/98

| Monitor Well | Casing Elevation (feet) | Depth To Water (feet) | Depth To Product (feet) | Water Elevation (feet) | Product Thickness (feet) | Adjusted Water Elevation (feet) | Dissolved Oxygen (ppm) | pH (SU) | Conductivity (uS) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| MW-#1 | 29.23 | 8.83 | N/A | 20.40 | 0.00 | – | 1.3 | 6.9 | 413 |
| MW-#2 | 30.29 | 10.20 | N/A | 20.09 | 0.00 | – | 0.6 | 5.8 | 391 |
| MW-#3 | 27.98 | 7.84 | N/A | 20.14 | 0.00 | – | 1.8 | 6.2 | 487 |
| MW-#4 | 28.19 | 7.22 | N/A | 20.97 | 0.00 | – | 1.0 | 5.9 | 220 |
| MW-#5 | 29.71 | 1.89 | N/A | 27.82 | 0.00 | – | 2.0 | 6.8 | 394 |
| MW-#6 | 30.60 | 11.33 | N/A | 19.27 | 0.00 | – | 2.5 | 6.7 | 648 |

Casing elevations based on data from Compliance Management Inc. report dated February, 1997
N/A = Not Applicable

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TABLE 2
SUMMARY OF LABORATORY ANALYSES
ug/l

| | | Intern. Hydronics | | Brinkerhoff/ Accredited | | | Brinkerhoff/ GTEL | Compliance/ Water Works | Matrix/ AllService | Matrix/ AllService | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW#1 | | SEP. 93 | DEC. 93 | JAN. 95 | DEC. 95 | MAR. 96 | JUL. 96 | DEC. 96 | MAY 98 | JULY 98 | MAY 98 TOTAL BTEX |
| | LEAD | 71 | NA | 46 | 12.6 | 14.1 | 11 | 124.6 | 375 | 6.18 | |
| | BENZENE | 280 | 350 | 35 | 120 | 37 | 46 | <20 | 8 | NA | |
| | TOLUENE | 3000 | 7500 | 79 | 4400 | 4600 | 4200 | 3500 | 1020 | NA | |
| | ETHYLBENZENE | 620 | 1600 | 60 | 3200 | 1300 | 1800 | 2200 | 1220 | NA | |
| | TOTAL XYLENES | 3900 | 8700 | 267 | 6400 | 7800 | 10000 | 8000 | 2720 | NA | 4968 |
| MW#2 | | SEP. 93 | DEC. 93 | JAN. 95 | DEC. 95 | MAR. 96 | JUL. 96 | DEC. 96 | MAY 98 | JULY 98 | MAY 98 TOTAL BTEX |
| | LEAD | NS | NA | <10 | <10 | NA | NS | 14.7 | 8 | NA | |
| | BENZENE | NS | NA | <5 | NA | NA | NS | <1 | <0.1 | NA | |
| | TOLUENE | NS | NA | <5 | NA | NA | NS | <2 | <0.1 | NA | |
| | ETHYLBENZENE | NS | NA | <5 | NA | NA | NS | <1 | <0.2 | NA | |
| | TOTAL XYLENES | NS | NA | <10 | NA | NA | NS | <3 | <0.2 | NA | ND |
| MW#5 | | SEP. 93 | DEC. 93 | JAN. 95 | DEC. 95 | MAR. 96 | JUL. 96 | DEC. 96 | MAY 98 | JULY 98 | MAY 98 TOTAL BTEX |
| | LEAD | NS | NI | 12 | <10 | NS | NS | 159.1 | 45 | NA | |
| | BENZENE | NS | NI | <5 | <0.4 | NS | NS | <1 | <0.1 | NA | |
| | TOLUENE | NS | NI | <5 | <0.5 | NS | NS | <2 | <0.1 | NA | |
| | ETHYLBENZENE | NS | NI | <5 | <1 | NS | NS | <1 | <0.2 | NA | |
| | TOTAL XYLENES | NS | NI | <10 | 3.5 | NS | NS | <3 | <0.2 | NA | ND |
| MW#6 | | SEP. 93 | DEC. 93 | JAN. 95 | DEC. 95 | MAR. 96 | JUL. 96 | DEC. 96 | MAY 98 | JULY 98 | MAY 98 TOTAL BTEX |
| | LEAD | NS | NI | 15 | <10 | NS | <4 | 24.4 | 7 | NA | |
| | BENZENE | NS | NI | <5 | <0.4 | NS | ND | <1 | <0.1 | NA | |
| | TOLUENE | NS | NI | <5 | <0.5 | NS | ND | <2 | <0.1 | NA | |
| | ETHYLBENZENE | NS | NI | <5 | <1 | NS | ND | <1 | <0.2 | NA | |
| | TOTAL XYLENES | NS | NI | <10 | <4.9 | NS | ND | <3 | <0.2 | NA | ND |

Data for sampling rounds from December , 1993 to December, 1996 based on data presented by Compliance Management Inc.
Sampling for lead analysis in July, 1998 accomplished by trickle flow.
Lead analyses for May, 1998 and December, 1996 presumed to be due to particulate contamination.
Lead data presented by Compliance Management Inc. may not be accurate based on NJDEP comments in letter dated March 26, 1997.

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2:04 PM, 8/24/98

Benzene

## CEA Calculations

| | | | |
|---|---|---|---|
| Hydraulic Conductivity (K) | 0.003 | ft/day | Vs = K*I/ne |
| Hydraulic Gradient (I) | 0.005263 | ft/ft | Vs = 3.16E-05 ft/day |
| Effective Porosity (ne) | 0.5 | dimensionless | |
| | | | |
| Bulk Density of Formation (pb) | 1.4 | g/cc | Rd = 1+(Kd*pb/ne) |
| Soil Sorption Coef. (Koc) | 63 | ml/g | Rd = 1.882 |
| Fraction Organic Carbon (foc) | 0.005 | | |
| | | | |
| Seepage Velocity (Vs) | 3.16E-05 | ft/day | Vpt = Vs/Rd |
| Retardation Factor (Rd) | 1.882 | | Vpt = 0.000 ft/day |
| Pollutant Transport Rate (Vpt) | 1.68E-05 | ft/day | |
| | | | |
| Sample Location | MW-1 | | |
| Compound of Concern | Benzene | | t1/2 = 0.693*dt/ln(C/Co) |
| Site Calculated Half-Life (t1/2) | 291 | days | t1/2 = 291 days |
| Initial Concentration (Co) | 350 | ug/l | |
| Second Concentration (C) | 8 | ug/l | Alternate t1/2 |
| Time Interval (dt) | 1585 | days | t1/2 = 291 days |
| | | | |
| Most Recent Concentration | 8 | | |
| GWQS | 1 | | |
| Calculated Half-Life | 291 | days | |
| Time to Reach GWQS | 872 | days | |
| Time to Reach GWQS | 2 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |
| | | | |
| Most Recent Concentration | 8 | | |
| GWQS | 1 | | |
| Alternate Half-Life | 291 | days | |
| Time to Reach GWQS | 873 | days | |
| Time to Reach GWQS | 2.39 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |

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Toluene

## CEA Calculations

| | | | |
|---|---|---|---|
| Hydraulic Conductivity (K) | 0.003 | ft/day | Vs = K*I/ne |
| Hydraulic Gradient (I) | 0.005263 | ft/ft | Vs = 0.000 ft/day |
| Effective Porosity (ne) | 0.5 | dimensionless | |
| | | | |
| Bulk Density of Formation (pb) | 1.4 | g/cc | Rd = 1+(Kd*pb/ne) |
| Soil Sorption Coef. (Koc) | 63 | ml/g | Rd = 1.882 |
| Fraction Organic Carbon (foc) | 0.005 | | |
| | | | |
| Seepage Velocity (Vs) | 3.16E-05 | ft/day | Vpt = Vs/Rd |
| Retardation Factor (Rd) | 1.882 | | Vpt = 1.68E-05 ft/day |
| Pollutant Transport Rate (Vpt) | 1.68E-05 | ft/day | |
| | | | |
| Sample Location | MW-1 | | |
| Compound of Concern | Toluene | | t1/2 = 0.693*dt/ln(C/Co) |
| Site Calculated Half-Life (t1/2) | 559 | days | t1/2 = 559 days |
| Initial Concentration (Co) | 7500 | ug/l | |
| Second Concentration (C) | 1020 | ug/l | Alternate t1/2 |
| Time Interval (dt) | 1610 | days | t1/2 = 291 days |
| | | | |
| Most Recent Concentration | 1020 | | |
| GWQS | 1000 | | |
| Calculated Half-Life | 559 | days | |
| Time to Reach GWQS | 16 | days | |
| Time to Reach GWQS | 0 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |
| | | | |
| Most Recent Concentration | 1020 | | |
| GWQS | 1000 | | |
| Alternate Half-Life | 291 | days | |
| Time to Reach GWQS | 8 | days | |
| Time to Reach GWQS | 0.02 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |

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Ethylbenzene

## CEA Calculations

| | | | |
|---|---|---|---|
| Hydraulic Conductivity (K) | 0.003 | ft/day | Vs = K*I/ne |
| Hydraulic Gradient (I) | 0.005263 | ft/ft | Vs = 0.000 ft/day |
| Effective Porosity (ne) | 0.5 | dimensionless | |
| | | | |
| Bulk Density of Formation (pb) | 1.4 | g/cc | Rd = 1+(Kd*pb/ne) |
| Soil Sorption Coef. (Koc) | 63 | ml/g | Rd = 1.882 |
| Fraction Organic Carbon (foc) | 0.005 | | |
| | | | |
| Seepage Velocity (Vs) | 3.16E-05 | ft/day | Vpt = Vs/Rd |
| Retardation Factor (Rd) | 1.882 | | Vpt = 1.68E-05 ft/day |
| Pollutant Transport Rate (Vpt) | 1.68E-05 | ft/day | |
| | | | |
| Sample Location | MW-1 | | |
| Compound of Concern | Ethylbenz | | t1/2 = 0.693*dt/ln(C/Co) |
| Site Calculated Half-Life (t1/2) | 632 | days | t1/2 = 632 days |
| Initial Concentration (Co) | 3200 | ug/l | |
| Second Concentration (C) | 1220 | ug/l | Alternate t1/2 |
| Time Interval (dt) | 880 | days | t1/2 = 291 days |
| | | | |
| Most Recent Concentration | 1220 | | |
| GWQS | 700 | | |
| Calculated Half-Life | 632 | days | |
| Time to Reach GWQS | 507 | days | |
| Time to Reach GWQS | 1 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |
| | | | |
| Most Recent Concentration | 1220 | | |
| GWQS | 700 | | |
| Alternate Half-Life | 291 | days | |
| Time to Reach GWQS | 233 | days | |
| Time to Reach GWQS | 0.64 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |

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Xylene

## CEA Calculations

| | | | |
|---|---|---|---|
| Hydraulic Conductivity (K) | 0.003 ft/day | Vs = K*I/ne | |
| Hydraulic Gradient (I) | 0.005263 ft/ft | Vs = | 0.000 ft/day |
| Effective Porosity (ne) | 0.5 dimensionless | | |
| | | | |
| Bulk Density of Formation (pb) | 1.4 g/cc | Rd = 1+(Kd*pb/ne) | |
| Soil Sorption Coef. (Koc) | 63 ml/g | Rd = | 1.882 |
| Fraction Organic Carbon (foc) | 0.005 | | |
| | | | |
| Seepage Velocity (Vs) | 3.16E-05 ft/day | Vpt = Vs/Rd | |
| Retardation Factor (Rd) | 1.882 | Vpt = | 1.68E-05 ft/day |
| Pollutant Transport Rate (Vpt) | 1.68E-05 ft/day | | |
| | | | |
| Sample Location | MW-1 | | |
| Compound of Concern | Xylene | t1/2 = 0.693*dt/ln(C/Co) | |
| Site Calculated Half-Life (t1/2) | 357 days | t1/2 = | 357 days |
| Initial Concentration (Co) | 10000 ug/l | | |
| Second Concentration (C) | 2720 ug/l | Alternate t1/2 | |
| Time Interval (dt) | 670 days | t1/2 = | 291 days |
| | | | |
| Most Recent Concentration | 2720 | | |
| GWQS | 1000 | | |
| Calculated Half-Life | 357 days | | |
| Time to Reach GWQS | 515 days | | |
| Time to Reach GWQS | 1 yrs | D = Vpt*t | |
| Length of Transport (D) | 0 feet | D = | 0 feet |
| | | | |
| Most Recent Concentration | 2720 | | |
| GWQS | 1000 | | |
| Alternate Half-Life | 291 days | | |
| Time to Reach GWQS | 420 days | | |
| Time to Reach GWQS | 1.15 yrs | D = Vpt*t | |
| Length of Transport (D) | 0 feet | D = | 0 feet |

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Xylene (2)

## CEA Calculations

| | | | |
|---|---|---|---|
| Hydraulic Conductivity (K) | 0.003 | ft/day | Vs = K*I/ne |
| Hydraulic Gradient (I) | 0.005263 | ft/ft | Vs = 0.000 ft/day |
| Effective Porosity (ne) | 0.5 | dimensionless | |
| | | | |
| Bulk Density of Formation (pb) | 1.4 | g/cc | Rd = 1+(Kd*pb/ne) |
| Soil Sorption Coef. (Koc) | 63 | ml/g | Rd = 1.882 |
| Fraction Organic Carbon (foc) | 0.005 | | |
| | | | |
| Seepage Velocity (Vs) | 3.16E-05 | ft/day | Vpt = Vs/Rd |
| Retardation Factor (Rd) | 1.882 | | Vpt = 1.68E-05 ft/day |
| Pollutant Transport Rate (Vpt) | 1.68E-05 | ft/day | |
| | | | |
| Sample Location | MW-1 | | |
| Compound of Concern | Xylene | | t1/2 = 0.693*dt/ln(C/Co) |
| Site Calculated Half-Life (t1/2) | 960 | days | t1/2 = 960 days |
| Initial Concentration (Co) | 8700 | ug/l | |
| Second Concentration (C) | 2720 | ug/l | Alternate t1/2 |
| Time Interval (dt) | 1610 | days | t1/2 = 291 days |
| | | | |
| Most Recent Concentration | 2720 | | |
| GWQS | 1000 | | |
| Calculated Half-Life | 960 | days | |
| Time to Reach GWQS | 1386 | days | |
| Time to Reach GWQS | 4 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |
| | | | |
| Most Recent Concentration | 2720 | | |
| GWQS | 1000 | | |
| Alternate Half-Life | 291 | days | |
| Time to Reach GWQS | 420 | days | |
| Time to Reach GWQS | 1.15 | yrs | D = Vpt*t |
| Length of Transport (D) | 0 | feet | D = 0 feet |

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