

1R - 428-59

REPORTS

DATE:

2-18-13

L. Peter Galusky, Jr. Ph.D., P.G.

Texerra LLC

20055 Laredo Lane Monument, CO 80132
Tel: 719-339-6791 E-mail: lpg@texerra.com

February 18th, 2013

Mr. Edward Hansen

New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

Re: **Remediation Termination Request**
Rice Operating Company – Hobbs A-6 vent
UL A, Section 6, T19S, R38E
OCD Case No. 1R428-59

Sent via Certified Mail w/ Return Receipt No. 7011 0110 0002 5197 1334

Mr. Hansen:

This letter summarizes the results of groundwater monitoring over the past several years for Rice Operating Company's Hobbs A-6 vent project.

Data that have been collected for this site since 2008 support the following observations:

- The direction of groundwater flow is believed to be toward the southeast based upon regional groundwater gradient, which generally parallels the ground surface topography (Appendix – Figure 1). The depth to groundwater (water table) is approximately 51 ft bgs.
- Residual soil chloride concentrations from a deep soil bore, SB-1 (Appendix – Figure 2) taken near the former vent location were ranged from 476 to 1,036 mg/kg from 0 to 35 ft bgs then dropped to 598 mg/kg at 45 ft bgs. Residual soil hydrocarbon levels were also elevated, measuring 3,738 mg/kg (PID) at 40 ft bgs but dropping to 169 mg/kg at 45 ft bgs. It is important to note, however, that these concentrations are from a point sample and may not be indicative of a widely affected *area*. Thus, the actual mass of residual contaminants may be less than these point-values suggest.
- Groundwater chloride concentrations have been low (< 100 mg/L) and BTEX below laboratory detection limits for the near-source monitor well (MW-1) located approximately 85 ft SE of the former vent location (Appendix – Figure 3).

The A-6 vent location had been in operation for approximately 40 years prior to its removal from service in 2008. It is therefore reasonable to believe that enough time has transpired to affect groundwater chloride or dissolved hydrocarbon (BTEX) concentrations in the near-source monitor well if the former junction box had contributed

Rice Operating Company – Hobbs A-6 Vent

sufficient chloride or hydrocarbon mass to do so. The fact that this well has been clean since samples have been taken (beginning in 2009) indicates that the former junction box has not contributed sufficient contaminant mass to substantially affect groundwater quality.

The MultiMed simulation model was run to estimate the potential elevation in groundwater chloride and BTEX concentrations. Key input parameters for the chloride and BTEX simulations are given in the Appendix (Figure 4). The chloride model was run based on an initial soil chloride concentration of 598 mg/kg at 45 ft bgs moving through the lower 6+/- ft (2.0 m) of the unsaturated zone to the water table. The maximum predicted elevation in the concentration of chloride in groundwater 1 m down-gradient from the former junction box was 235 mg/liter 20 yrs from present (Appendix – Figures 5, 6). This is below the present WQCC groundwater standard of 250 mg/liter and it is consistent with the most recent (December 2012) observed groundwater chloride concentration of 52 mg/liter in the near-source monitor well (MW-1).

The BTEX models were run based on their initial soil concentrations (benzene 2.8, toluene 3.3, ethylbenzene 12.4 and xylene 44.7 mg/kg) at 40 ft bgs moving through the lower 11+/- ft (3.35 m) of the unsaturated zone to the water table. The maximum predicted elevation in groundwater BTEX 1m down-gradient from the former junction box was 0.00353 mg/l for benzene, 0.0041 mg/l for toluene, 0.0158 mg/l for ethylbenzene, and 0.0568 mg/l for xylene, below WQCC groundwater standards of 0.01 mg/l for benzene, 0.75 mg/l for toluene and ethylbenzene, and 0.62 mg/l for xylene (Appendix – Figures 5, 7-10).

Given that this former junction box is likely not the cause of present or potential future impact to groundwater quality and vegetation at the site has recovered (Appendix – Figure 11), we respectfully request that OCD grant remediation termination or similar regulatory closure status to this project.

ROC is the service provider (agent) for the Hobbs SWD System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

Rice Operating Company – Hobbs A-6 Vent

Please do not hesitate to contact either Rice Operating Company or myself if you have any questions or need additional information.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to be 'L. Peter Galusky, Jr.', written in a cursive style.

L. Peter Galusky, Jr. Ph.D.
Principal

Copy: Rice Operating Company

Attachments: Appendices as noted, above.

APPENDIX

Figure 1 – Location Map

Figure 2 – Summary of Soil Analytical Data

Figure 3 – Groundwater Monitoring Data

Figure 4a – Key MultiMed Parameter Estimates – Chloride

Figure 4b – Key MultiMed Parameter Estimates – BTEX

Figure 5 – MultiMed Groundwater Chloride and BTEX Projection Summaries

Figure 6a – MultiMed Chloride Projection Graph

Figure 6b – MultiMed Chloride Report

Figure 7a – MultiMed Benzene Projection Graph

Figure 7b – MultiMed Benzene Report

Figure 8a – MultiMed Toluene Projection Graph

Figure 8b – MultiMed Toluene Report

Figure 9a – MultiMed Ethylbenzene Projection Graph

Figure 9b – MultiMed Ethylbenzene Report

Figure 10a – MultiMed Xylene Projection Graph

Figure 10b – MultiMed Xylene Report

Figure 11 – Photographs of Site Restoration

Figure 12 – Monitor Well 1 Lab Report

Site Map

Figure 1



Figure 2

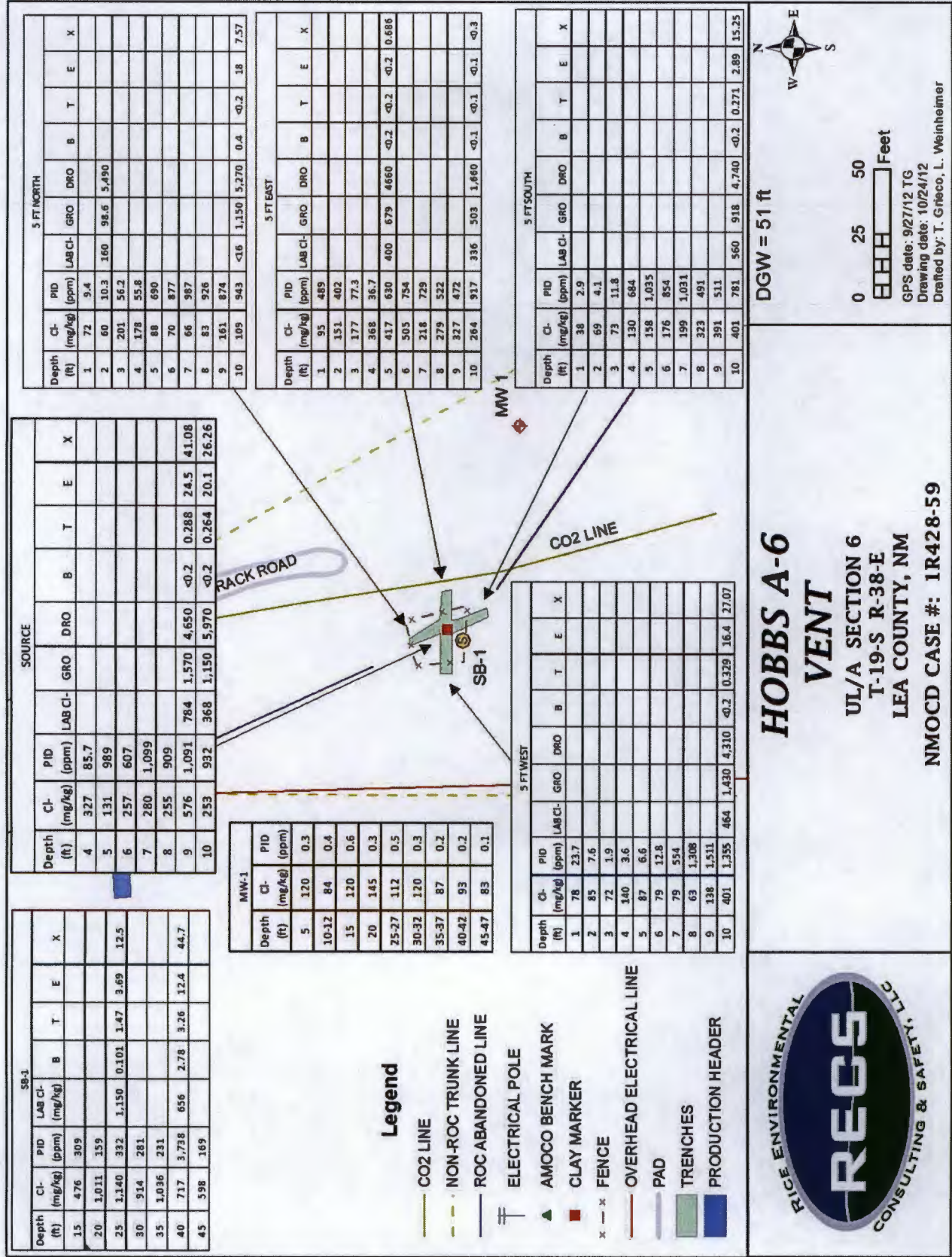


Figure 3

ROC Hobbs A-6 vent Groundwater Monitoring Results													
MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	49.56	67.44	2.9	10	3/31/09	44	609	<0.001	<0.001	<0.001	<0.003	136	Clear No Odor
1	49.74	67.44	2.8	10	6/10/09	40	654	<0.001	<0.001	<0.001	<0.003	123	Clear No Odor
1	49.83	67.44	2.8	10	9/14/09	40	645	<0.001	<0.001	<0.001	<0.003	113	Clear No odor
1	49.92	67.44	2.8	10	11/20/09	40	611	<0.001	<0.001	<0.001	<0.003	90.6	Clear No odor
1	50.11	67.46	2.8	10	3/17/10	40	661	<0.001	<0.001	<0.001	<0.003	146	Clear No odor
1	50.26	67.46	2.8	10	6/8/10	44	673	<0.001	<0.001	<0.001	<0.003	130	Clear No odor
1	49.97	67.46	2.8	10	7/14/10	44	644	<0.001	<0.001	<0.001	<0.003	115	Clear No odor
1	49.23	67.46	2.9	10	12/7/10	44	537	<0.001	<0.001	<0.001	<0.003	109	Clear No odor
1	50.45	67.46	2.7	10	6/24/11	44	646	<0.001	<0.001	<0.001	<0.003	146	Clear No odor
1	50.82	67.46	2.7	10	12/14/11	44	676	<0.001	<0.001	<0.001	<0.003	168	Clear No odor
1	51.75	67.46	2.5	10	6/15/12	44	543	<0.001	<0.001	<0.001	<0.003	96	Clear No Odor
1	51.41	67.46	2.6	10	12/12/12	52	550	<0.001	<0.001	<0.001	<0.003	94	Clear No Odor

Figure 4a

MultiMed Key Parameter Values**Rice Operating Company****Texerra LLC****February 5, 2013****Facility:****Hobbs Vent A-6 Chloride Model****Source**

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Source area	m ²	25	... estimated.
Source length	m		
Source width	m		
Source infiltration rate	m/yr	0.03048	... for facility w/ no subsurface liner. ... concentration @ 45 ft bgs from SB-
Initial concentration	mg/l	598	1.
Source decay coeff	per year	2.5%	... assumed.

Unsat Zone Flow

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Flow layer thickness	m	2	... unsaturated depth beneath deepest chloride measurement in SB-1.
Sat hydraulic conductivity	cm/hr	3.6	... assumed.
Effective porosity	fraction	0.25	... assumed.

Unsat Zone Transport

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Transport layer thickness	m	2	... unsaturated depth beneath deepest chloride measurement in SB-1.
Bulk density	g/cm ³	1.99	... calculated based on porosity.

Saturated Zone

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Aquifer thickness	m	6.10	... equivalent to 20 ft.
Mixing zone thickness	m		... let model derive value.
Effective porosity	fraction	0.3	... assumed.
Bulk density	g/cm ³	1.855	... calculated based on porosity.
Sat hydraulic conductivity	m/yr	315	... representative for Ogallala aquifer. ... estimated from regional surface
Hydraulic gradient	m/m	0.003	topography.

Wel Loc and Time

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Radial distance to well	m	1	... prescribed by NMOCD.
Time step option	yrs	500 yrs @ 10 yr increments	... encompasses projected peak concentration.

Figure 4b

MultiMed Key Parameter Values**Rice Operating Company****Texerra LLC****February 5, 2013****Facility:****Hobbs Vent A-6 BTEX Model****Source**

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Source area	m ²	25	... estimated.
Source length	m		
Source width	m		
Source infiltration rate	m/yr	0.03048	... for facility w/ no subsurface liner.
Initial concentrations	mg/l	2.8; 3.3; 12.4; 44.7	... benzene, toluene. ethylbenzene & xylene @ 40 ft bgs from SB-1
Source decay coeff	per year	2.5%	... assumed.
Sorbed phase biodecay rate	per year	25.0%	... assumed.
Dissolved phase biodecay rate	per year	25.0%	... assumed.

Unsat Zone Flow

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Flow layer thickness	m	3.35	... unsaturated depth beneath deepest BTEX measurement in SB-1.
Sat hydraulic conductivity	cm/hr	3.6	... assumed.
Effective porosity	fraction	0.25	... assumed.

Unsat Zone Transport

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Transport layer thickness	m	3.35	... unsaturated depth beneath deepest BTEX measurement in SB-1.
Bulk density	g/cm ³	3.6	... calculated based on porosity.

Saturated Zone

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Aquifer thickness	m	6.10	... equivalent to 20 ft.
Mixing zone thickness	m		... let model derive value.
Effective porosity	fraction	0.3	... assumed.
Bulk density	g/cm ³	1.855	... calculated based on porosity.
Sat hydraulic conductivity	m/yr	315	... representative for Ogallala aquifer.
Hydraulic gradient	m/m	0.003	... estimated from regional surface topography.

Well Loc and Time

<u>parameter</u>	<u>unit</u>	<u>value</u>	<u>justification/notes</u>
Radial distance to well	m	1	... prescribed by NMOCD.
Time step option	500 yrs @ 10 yr increments		... encompasses projected peak concentration.

Figure 5

Rice Operating Company

Hobbs A-6 Vent

MultiMed Chloride & BTEX Initial Concentrations and Model

February 5, 2013

Initial Measured Soil CHLORIDE & BTEX Concentrations

	mg/kg	
Chloride	598	... @ 45 ft bgs from SB-1
Benzene	2.7800	... @ 40 ft bgs from SB-1
Toluene	3.2600	... @ 40 ft bgs from SB-1
Ethylbenzene	12.4000	... @ 40 ft bgs from SB-1
Xylene	44.7000	... @ 40 ft bgs from SB-1

MultiMed Projected Groundwater CHLORIDE & BTEX Concentrations 1m Downgradient

	mg/kg	... at year	WQCC Drinking Water Standard (mg/kg)	% of WQCC Standard
Chloride	235.00	20	250	94%
Benzene	0.0035	30	0.0100	35%
Toluene	0.0041	30	0.7500	1%
Ethylbenzene	0.0158	30	0.7500	2%
Xylene	0.0568	30	0.6200	9%

Figure 6a

Projected Chloride Concentration 1m Downgradient from Source
[WQCC Standard is 250 mg/l]

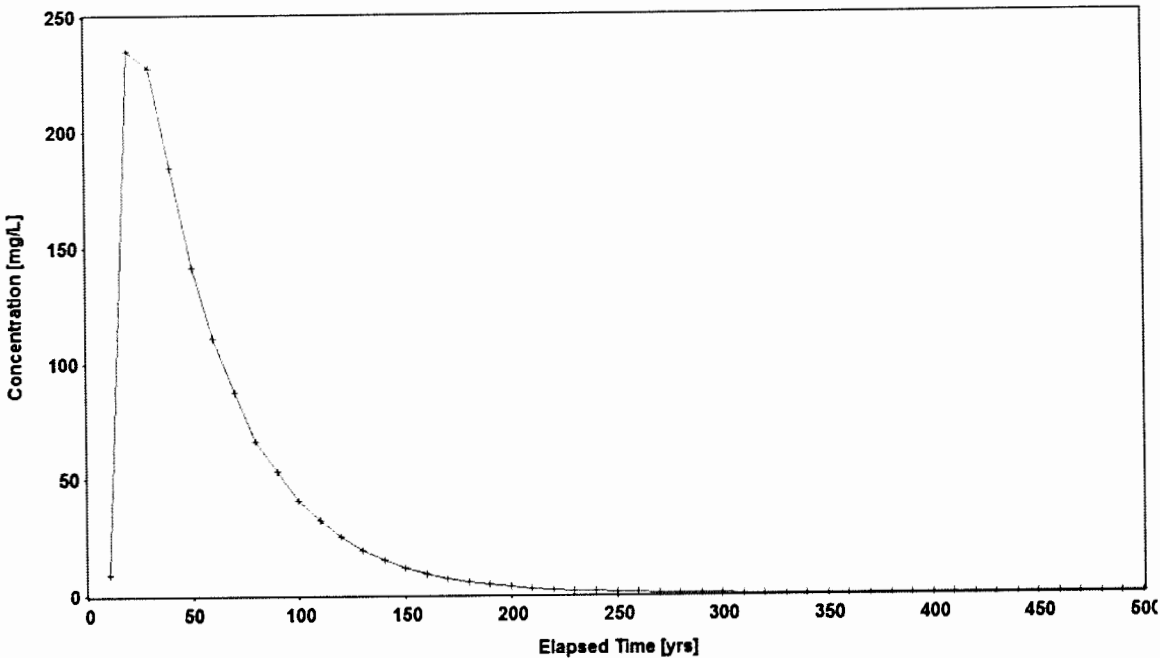


Figure 6b

MULTIMED V1.01 DATE OF CALCULATIONS: 5-FEB-2013 TIME: 14:40:18 Hobbs A-6 vent (1R428-59) MultiMed Chloride 11.1.12

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.50, 2005)

1 Run options

Chemical simulated is Chloride

Option Chosen Saturated and unsaturated zone models
Run was DETERMIN
Infiltration Specified By User: 3.048E-02 m/yr
Run was transient
Well Times: Entered Explicitly
Reject runs if Y coordinate outside plume
Reject runs if Z coordinate outside plume
Gaussian source used in saturated zone model

1 UNSATURATED ZONE FLOW MODEL PARAMETERS
(input parameter description and value)
NP - Total number of nodal points 240
NMAT - Number of different porous materials 1
KPROP - Van Genuchten or Brooks and Corey 1
IMSHGN - Spatial discretization option 1
NVFLAYR - Number of layers in flow model 1

1 OPTIONS CHOSEN

Van Genuchten functional coefficients
User defined coordinate system

Layer information

LAYER NO. LAYER THICKNESS MATERIAL PROPERTY
1 2.00 1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS			LIMITS	
			MEAN	STD DEV	MIN	MAX	
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.	
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.	
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.	
Depth of the unsaturated zone	m	CONSTANT	2.00	0.000	0.000	0.000	

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.116	-999.	-999.	-999.
Brook and Corey exponent, EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY - Number of different layers used 1
 NTSTPS - Number of time values concentration calc 40
 DUMMY - Not presently used 1
 ISOL - Type of scheme used in unsaturated zone 2
 N - Steffest terms or number of increments 18
 NTEL - Points in Lagrangian interpolation 3
 NGPTS - Number of Gauss points 104
 NIT - Convolution integral segments 2
 IBOUND - Type of boundary condition 3
 ITSGEN - Time values generated or input 1
 TMAX - Max simulation time 0.0
 WTFUN - Weighting factor 1.2

OPTIONS CHOSEN

Convolution integral approach
 Exponentially decaying continuous source
 Computer generated times for computing concentrations

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN	MAX
Thickness of layer	m	CONSTANT	2.00	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.	-999.	-999.

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	.999	.999	.999
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	.999	.999	.999
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	.999	.999	.999
Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	.999	.999	.999
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	.999	.999	.999
Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	.999	.999	.999
Reference temperature	C	CONSTANT	25.0	.999	.999	.999
Normalized distribution coefficient	ml/g	CONSTANT	0.000	.999	.999	.999
Distribution coefficient	--	DERIVED	.999	.999	.999	.999
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	.999	.999	.999
Air diffusion coefficient	cm2/s	CONSTANT	.999	.999	.999	.999
Reference temperature for air diffusion	C	CONSTANT	.999	.999	.999	.999
Molecular weight	g/M	CONSTANT	.999	.999	.999	.999
Mole fraction of solute	--	CONSTANT	.999	.999	.999	.999
Vapor pressure of solute	mm Hg	CONSTANT	.999	.999	.999	.999
Henry's law constant	atm-m^3/M	CONSTANT	.999	.999	.999	.999
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.000
Not currently used		CONSTANT	0.000	0.000	0.000	0.000
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN STD DEV	LIMITS MIN MAX
Infiltration rate	m/yr	CONSTANT	0.305E-01	-999. -999.
Area of waste disposal unit	m^2	CONSTANT	25.0	-999. -999.
Duration of pulse	yr	DERIVED	10.0	-999. -999.
Spread of contaminant source	m	DERIVED	-999.	-999. -999.
Recharge rate	m/yr	CONSTANT	0.000	-999. -999.
Source decay constant	1/yr	CONSTANT	0.250E-01	0.000 0.000
Initial concentration at landfill	mg/l	CONSTANT	598.	-999. -999.
Length scale of facility	m	DERIVED	1.00	-999. -999.
Width scale of facility	m	DERIVED	1.00	-999. -999.
Near field dilution		DERIVED	1.00 0.000	0.000 1.000

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.86	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	6.10	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.300E-02	-999.	-999.	-999.

Groundwater seepage velocity					
Retardation coefficient	m/yr	DERIVED	-999.	-999.	-999.
Longitudinal dispersivity	--	DERIVED	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.
Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.
Temperature of aquifer	C	FUNCTION OF X	-999.	-999.	-999.
pH	--	CONSTANT	20.0	-999.	-999.
Organic carbon content (fraction)		CONSTANT	7.00	-999.	-999.
Well distance from site	m	CONSTANT	0.000	-999.	-999.
Angle off center	degree	CONSTANT	1.00	-999.	-999.
Well vertical distance	m	CONSTANT	0.000	-999.	-999.

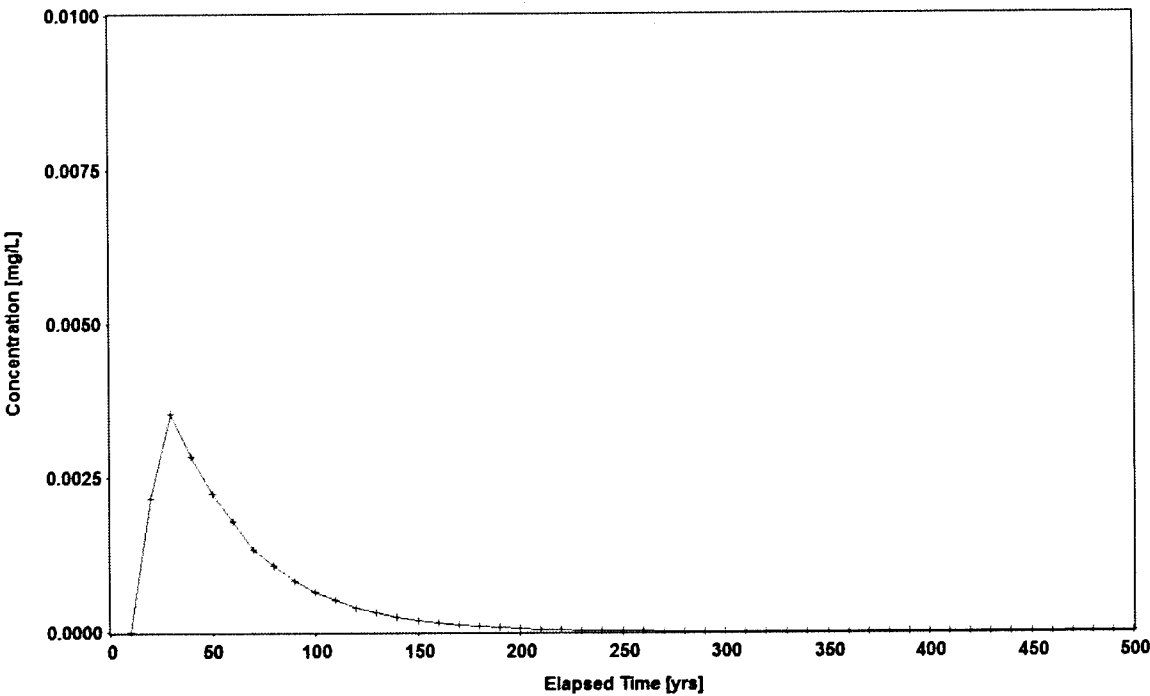
Hobbs A-6 vent (1R428-59) Multimed Chloride 11.1.12

TIME	CONCENTRATION
0.100E+02	0.87825E+01
0.200E+02	0.23513E+03
0.300E+02	0.22735E+03
0.400E+02	0.18433E+03
0.500E+02	0.14172E+03
0.600E+02	0.11105E+03
0.700E+02	0.87647E+02
0.800E+02	0.65817E+02
0.900E+02	0.53194E+02
0.100E+03	0.40599E+02
0.110E+03	0.31868E+02
0.120E+03	0.25092E+02
0.130E+03	0.18896E+02
0.140E+03	0.15248E+02
0.150E+03	0.11602E+02
0.160E+03	0.91444E+01
0.170E+03	0.71823E+01
0.180E+03	0.54262E+01
0.190E+03	0.43704E+01
0.200E+03	0.33146E+01
0.210E+03	0.26237E+01
0.220E+03	0.20556E+01
0.230E+03	0.15582E+01
0.240E+03	0.12525E+01
0.250E+03	0.94682E+00
0.260E+03	0.75271E+00
0.270E+03	0.58823E+00
0.280E+03	0.44739E+00
0.290E+03	0.35889E+00
0.300E+03	0.27039E+00
0.310E+03	0.21591E+00
0.320E+03	0.16829E+00
0.330E+03	0.12844E+00
0.340E+03	0.10281E+00
0.350E+03	0.77191E-01
0.360E+03	0.61913E-01
0.370E+03	0.48126E-01
0.380E+03	0.36854E-01
0.390E+03	0.29436E-01
0.400E+03	0.22017E-01
0.410E+03	0.17738E-01
0.420E+03	0.13746E-01
0.430E+03	0.10560E-01
0.440E+03	0.84121E-02
0.450E+03	0.62642E-02

Hobbs A-6 vent (1R428-59) MultiMed Chloride 11.1.12
0.460E+03 0.50668E-02
0.470E+03 0.39111E-02
0.480E+03 0.30111E-02
0.490E+03 0.23892E-02
0.500E+03 0.17673E-02

Figure 7a

Projected BENZENE Concentration 1m Downgradient from Source
[WQCC Standard is 0.01 mg/l]



U.S. ENVIRONMENTAL PROTECTION AGENCY

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.50, 2005)

¹ Run options

Chemical simulated is BENZENE

Option Chosen
Run was
Infiltration Specified By User: 3.048E-02 m/yr
Run was transient
Well Times: Entered Explicitly
Reject runs if Y coordinate outside plume
Reject runs if Z coordinate outside plume
Gaussian source used in saturated zone model
Saturated and unsaturated zone models
DETERMIN

UNSATURATED ZONE FLOW MODEL PARAMETERS	
(input parameter description and value)	
NP	Total number of nodal points
NMAT	Number of different porous materials
KPROP	Van Genuchten or Brooks and Corey
IMSHGN	Spatial discretization option
NVFLAYR	Number of layers in flow model

OPTIONS CHOSEN

Van Genuchten functional coefficients
User defined coordinate system

Layer information

LAYER NO.	LAYER THICKNESS	MATERIAL PROPERTY
1	3.35	1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	3.35	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN	MAX
Residual water content	--	CONSTANT	0.116	-999.	-999.	-999.
Brook and Corey exponent, EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	-999.	-999.

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used	1
NTSTPS	- Number of time values concentration calc	40
DUMMY	- Not presently used	1
ISOL	- Type of scheme used in unsaturated zone	2
N	- Stehfest terms or number of increments	18
NTEL	- Points in Lagrangian interpolation	3
NGPTS	- Number of Gauss points	104
NIT	- Convolution integral segments	2
IBOUND	- Type of boundary condition	1
ITSGEN	- Time values generated or input	0.0
TMAX	- Max simulation time	--
WTFUN	- Weighting factor	1.2

OPTIONS CHOSEN

 Convolution integral approach
 Exponentially decaying continuous source
 Computer generated times for computing concentrations

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN MAX
Thickness of layer	m	CONSTANT	3.35	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.	-999.
Biological decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.
Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.
Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.000	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.
Air diffusion coefficient	cm ² /s	CONSTANT	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.
Henry's law constant	atm-m ³ /M	CONSTANT	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000
Not currently used		CONSTANT	0.000	0.000	0.000

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN MAX
Infiltration rate	m/yr	CONSTANT	0.305E-01	-999.	-999.
Area of waste disposal unit	m ²	CONSTANT	25.0	-999.	-999.
Duration of pulse	yr	DERIVED	10.0	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.250E-01	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	2.78	-999.	-999.
Length scale of facility	m	DERIVED	1.00	-999.	-999.
Width scale of facility	m	DERIVED	1.00	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	1.00

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.86	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	6.10	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315	-999.	-999.	-999.
Gradient (hydraulic)	m/yr	CONSTANT	0.300E-02	-999.	-999.	-999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	-999.	-999.
Retardation coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Temperature of aquifer	C	CONSTANT	20.0	-999.	-999.	-999.
pH	--	CONSTANT	7.00	-999.	-999.	-999.
Organic carbon content (fraction)	--	CONSTANT	0.000	-999.	-999.	-999.
Well distance from site	m	CONSTANT	1.00	-999.	-999.	-999.
Angle off center	degree	CONSTANT	0.000	-999.	-999.	-999.
Well vertical distance	m	CONSTANT	0.000	-999.	-999.	-999.

TIME	CONCENTRATION
0.100E+02	0.32359E-05
0.200E+02	0.21683E-02
0.300E+02	0.35333E-02
0.400E+02	0.28394E-02
0.500E+02	0.22489E-02
0.600E+02	0.17980E-02
0.700E+02	0.13472E-02
0.800E+02	0.10861E-02
0.900E+02	0.83772E-03
0.100E+03	0.65089E-03
0.110E+03	0.51410E-03
0.120E+03	0.38758E-03
0.130E+03	0.31216E-03
0.140E+03	0.23681E-03
0.150E+03	0.18789E-03
0.160E+03	0.14638E-03
0.170E+03	0.11225E-03
0.180E+03	0.89389E-04
0.190E+03	0.66756E-04
0.200E+03	0.54038E-04
0.210E+03	0.41445E-04
0.220E+03	0.32386E-04
0.230E+03	0.25449E-04
0.240E+03	0.19259E-04
0.250E+03	0.15438E-04

Hobbs A-6 vent (1R428-59) MultiMed BENZENE 02.05.2013 1pg

0.260E+03 0.11617E-04
0.270E+03 0.92821E-05
0.280E+03 0.71576E-05
0.290E+03 0.54960E-05
0.300E+03 0.43368E-05
0.310E+03 0.32313E-05
0.320E+03 0.25823E-05
0.330E+03 0.19438E-05
0.340E+03 0.15054E-05
0.350E+03 0.11537E-05
0.360E+03 0.85138E-06
0.370E+03 0.65765E-06
0.380E+03 0.46393E-06
0.390E+03 0.35086E-06
0.400E+03 0.24416E-06
0.410E+03 0.16340E-06
0.420E+03 0.10463E-06
0.430E+03 0.50020E-07
0.440E+03 0.17599E-07
0.450E+03 0.00000E+00
0.460E+03 0.00000E+00
0.470E+03 0.00000E+00
0.480E+03 0.00000E+00
0.490E+03 0.00000E+00
0.500E+03 0.00000E+00

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS			
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	3.35	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS			
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.116	-999.	-999.	-999.
Brook and Corey exponent, EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	-999.	-999.

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY - Number of different layers used 1
 NTSTPS - Number of time values concentration calc 40
 DUMMY - Not presently used 1
 ISOL - Type of scheme used in unsaturated zone 2
 N - Stehfest terms or number of increments 18
 NTEL - Points in Lagrangian interpolation 3
 NGPTS - Number of Gauss points 104
 NIT - Convolution integral segments 2
 IBOUND - Type of boundary condition 3
 ITSGEN - Time values generated or input 1
 TMAX - Max simulation time 0.0
 WTFUN - Weighting factor 1.2

OPTIONS CHOSEN

Convolution integral approach
 Exponentially decaying continuous source
 Computer generated times for computing concentrations

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS			
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	3.35	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.	-999.	-999.

Biological decay coefficient Hobbs A-6 vent (1R428-59) MultiMed TOLUENE 02.05.2013 lpg -999. -999.
1/yr CONSTANT 0.000 -999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	LIMITS MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.000	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry's law constant	atm-m ³ /M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	LIMITS MAX
Infiltration rate	m/yr	CONSTANT	0.305E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	25.0	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	10.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.250E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	3.26	-999.	-999.	-999.
Length scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Width scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	LIMITS MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.86	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	6.10	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.300E-02	-999.	-999.	-999.

Hobbs A-6 vent (1R428-59) MultiMed TOLUENE 02.05.2013 Ipg		
Groundwater seepage velocity	m/y	-999.
Retardation coefficient	-	-999.
Longitudinal dispersivity	-	-999.
Transverse dispersivity	m	-999.
Vertical dispersivity	m	-999.
Temperature of aquifer	C	-999.
pH	-	-999.
Organic carbon content (fraction)	-	-999.
Well distance from site	m	-999.
Angle off center	degree	-999.
Well vertical distance	m	-999.

TIME	CONCENTRATION
0.100E+02	0.37946E-05
0.200E+02	0.25404E-02
0.300E+02	0.41433E-02
0.400E+02	0.33297E-02
0.500E+02	0.26373E-02
0.600E+02	0.21085E-02
0.700E+02	0.15798E-02
0.800E+02	0.12736E-02
0.900E+02	0.98236E-03
0.100E+03	0.76328E-03
0.110E+03	0.60280E-03
0.120E+03	0.45451E-03
0.130E+03	0.36606E-03
0.140E+03	0.27770E-03
0.150E+03	0.22033E-03
0.160E+03	0.17166E-03
0.170E+03	0.13163E-03
0.180E+03	0.10482E-03
0.190E+03	0.78282E-04
0.200E+03	0.63368E-04
0.210E+03	0.48601E-04
0.220E+03	0.37977E-04
0.230E+03	0.29844E-04
0.240E+03	0.22584E-04
0.250E+03	0.18104E-04
0.260E+03	0.13623E-04
0.270E+03	0.10861E-04
0.280E+03	0.83935E-05
0.290E+03	0.64449E-05
0.300E+03	0.50856E-05
0.310E+03	0.37892E-05
0.320E+03	0.30282E-05
0.330E+03	0.22795E-05
0.340E+03	0.17654E-05
0.350E+03	0.13529E-05
0.360E+03	0.99838E-06
0.370E+03	0.77120E-06
0.380E+03	0.54403E-06
0.390E+03	0.41144E-06
0.400E+03	0.28631E-06
0.410E+03	0.19162E-06
0.420E+03	0.12269E-06
0.430E+03	0.58657E-07
0.440E+03	0.20638E-07
0.450E+03	0.00000E-00

Hobbs A-6 vent (1R428-59) MultiMed TOLUENE 02.05.2013 1pg
0.460E+03 0.00000E+00
0.470E+03 0.00000E+00
0.480E+03 0.00000E+00
0.490E+03 0.00000E+00
0.500E+03 0.00000E+00

Figure 9a

Projected ETHYLBENZENE Concentration 1m Downgradient from Source
[WQCC Standard is 0.75 mg/l]

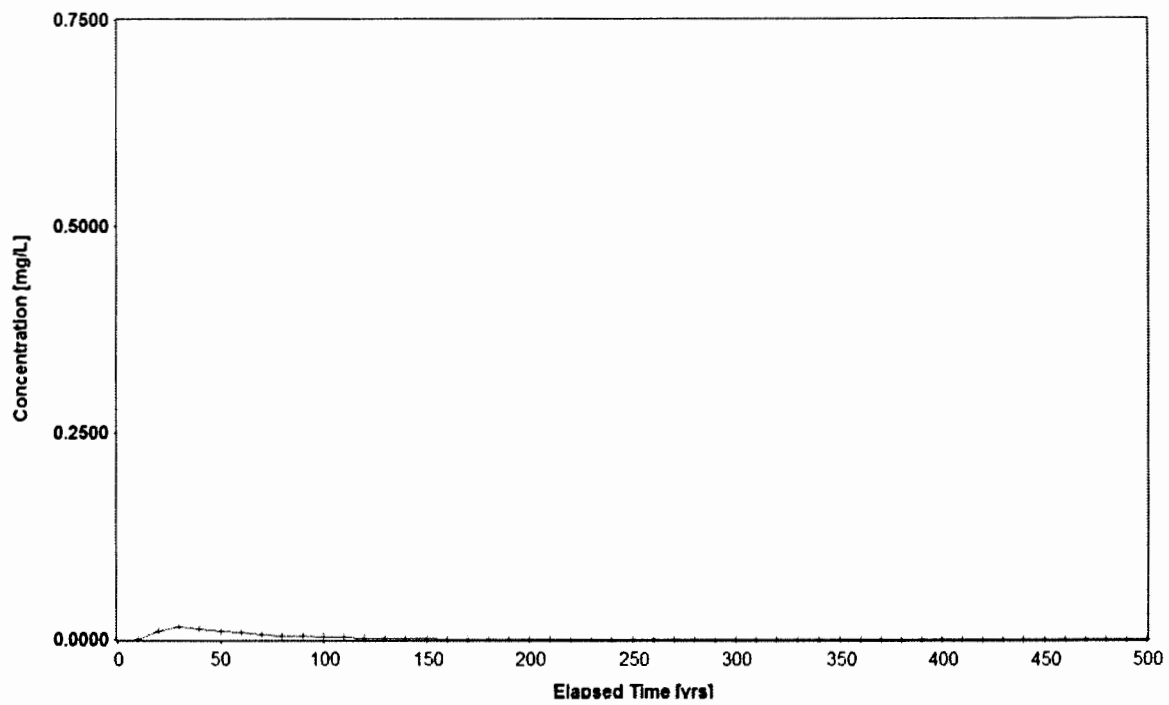


Figure 9b

U. S. ENVIRONMENTAL PROTECTION AGENCY

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.50, 2005)

¹ Run options

Chemical simulated is ETHYLBENZENE

Option Chosen	Saturated and unsaturated zone models
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

Operation Specimen
Run was
Infiltration Specified By User: 3.048E-02 m/yr
DETERMIN

Run was transient

Well Times: Entered Explicitly

Reject runs if Y coordinate outside plume

Reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

— —

UNSATURATED ZONE FLOW MODEL PARAMETERS
(input parameter description and value)

NP	(Input parameter description and value)	
	- Total number of nodal points	240

NMAT - Total number of nodal points
 NMAT - Number of different porous materials

KPROP
NMAT
- Number of different porous materials
- Van Genuchten or Brooks and Corey

- van der Vaart, D. W., de Boer, E., Groenwold, G. H., & Kok, J. (2008). *Spatial discretization option*

NVFLAYR - Number of layers in flow model

OPTIONS CHOSEN

OF 11 TONS CHOSEN

Van Guchten functional coefficients

User defined coordinate system

1

Layer information

Layer Information

LAYER NO.	LAYER THICKNESS	MATERIAL PROPERTY
1	0.001	Aluminum
2	0.001	Aluminum
3	0.001	Aluminum
4	0.001	Aluminum
5	0.001	Aluminum
6	0.001	Aluminum
7	0.001	Aluminum
8	0.001	Aluminum
9	0.001	Aluminum
10	0.001	Aluminum
11	0.001	Aluminum
12	0.001	Aluminum
13	0.001	Aluminum
14	0.001	Aluminum
15	0.001	Aluminum
16	0.001	Aluminum
17	0.001	Aluminum
18	0.001	Aluminum
19	0.001	Aluminum
20	0.001	Aluminum
21	0.001	Aluminum
22	0.001	Aluminum
23	0.001	Aluminum
24	0.001	Aluminum
25	0.001	Aluminum
26	0.001	Aluminum
27	0.001	Aluminum
28	0.001	Aluminum
29	0.001	Aluminum
30	0.001	Aluminum
31	0.001	Aluminum
32	0.001	Aluminum
33	0.001	Aluminum
34	0.001	Aluminum
35	0.001	Aluminum
36	0.001	Aluminum
37	0.001	Aluminum
38	0.001	Aluminum
39	0.001	Aluminum
40	0.001	Aluminum
41	0.001	Aluminum
42	0.001	Aluminum
43	0.001	Aluminum
44	0.001	Aluminum
45	0.001	Aluminum
46	0.001	Aluminum
47	0.001	Aluminum
48	0.001	Aluminum
49	0.001	Aluminum
50	0.001	Aluminum
51	0.001	Aluminum
52	0.001	Aluminum
53	0.001	Aluminum
54	0.001	Aluminum
55	0.001	Aluminum
56	0.001	Aluminum
57	0.001	Aluminum
58	0.001	Aluminum
59	0.001	Aluminum
60	0.001	Aluminum
61	0.001	Aluminum
62	0.001	Aluminum
63	0.001	Aluminum
64	0.001	Aluminum
65	0.001	Aluminum
66	0.001	Aluminum
67	0.001	Aluminum
68	0.001	Aluminum
69	0.001	Aluminum
70	0.001	Aluminum
71	0.001	Aluminum
72	0.001	Aluminum
73	0.001	Aluminum
74	0.001	Aluminum
75	0.001	Aluminum
76	0.001	Aluminum
77	0.001	Aluminum
78	0.001	Aluminum
79	0.001	Aluminum
80	0.001	Aluminum
81	0.001	Aluminum
82	0.001	Aluminum
83	0.001	Aluminum
84	0.001	Aluminum
85	0.001	Aluminum
86	0.001	Aluminum
87	0.001	Aluminum
88	0.001	Aluminum
89	0.001	Aluminum
90	0.001	Aluminum
91	0.001	Aluminum
92	0.001	Aluminum
93	0.001	Aluminum
94	0.001	Aluminum
95	0.001	Aluminum
96	0.001	Aluminum
97	0.001	Aluminum
98	0.001	Aluminum
99	0.001	Aluminum
100	0.001	Aluminum

EATER NO:	EATER FITNESS	INMATE FITNESS
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
59	59	59
60	60	60
61	61	61
62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

1	3	5	1
1	3	5	1

DATA FOR MATERIAL 11

DATA FOR MATERIAL

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		
			MEAN	STD DEV	LIMITS
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	3.35	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		
			MEAN	STD DEV	LIMITS
Residual water content	--	CONSTANT	0.116	-999.	-999.
Brook and Corey exponent, EN	--	CONSTANT	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

- NLAY - Number of different layers used 1
- NTSTPS - Number of time values concentration calc 40
- DUMMY - Not presently used 1
- ISOL - Type of scheme used in unsaturated zone 2
- NTEL - Stehfest terms or number of increments 18
- NGPTS - Points in Lagrangian interpolation 3
- NIT - Number of Gauss points 104
- NIT - Convolution integral segments 2
- BOUND - Type of boundary condition 3
- ITSGEN - Time values generated or input 1
- TMAX - Max simulation time 0.0
- WTFUN - Weighting factor 1.2

OPTIONS CHOSEN

- Convolution integral approach
- Exponentially decaying continuous source
- Computer generated times for computing concentrations

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		
			MEAN	STD DEV	LIMITS
Thickness of layer	m	CONSTANT	3.35	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.	-999.

Biological decay coefficient Hobbs A-6 vent (1R428-59) MultiMed ETHYLBENZENE 02.05.2013 1pg -999. -999. -999.
1/yr CONSTANT 0.000 -999.

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	LIMITS MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.000	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry's law constant	atm-m ³ /M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	LIMITS MAX
Infiltration rate	m/yr	CONSTANT	0.305E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	25.0	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	10.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.250E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	12.4	-999.	-999.	-999.
Length scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Width scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	LIMITS MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.86	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	6.10	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.300E-02	-999.	-999.	-999.

Hobbs A-6 vent (1R428-59) MultiMed ETHYLBENZENE 02.05.2013 1pg		
Groundwater seepage velocity	m/yr	-999.
Retardation coefficient	--	-999.
Longitudinal dispersivity	m	-999.
Transverse dispersivity	m	-999.
Vertical dispersivity	m	-999.
Temperature of aquifer	C	-999.
pH	--	-999.
Organic carbon content (fraction)		-999.
Well distance from site	m	-999.
Angle off center	degree	-999.
Well vertical distance	m	-999.

TIME	CONCENTRATION
0.100E+02	0.14434E-04
0.200E+02	0.96627E-02
0.300E+02	0.15760E-01
0.400E+02	0.12665E-01
0.500E+02	0.10031E-01
0.600E+02	0.80200E-02
0.700E+02	0.60091E-02
0.800E+02	0.48443E-02
0.900E+02	0.37366E-02
0.100E+03	0.29033E-02
0.110E+03	0.22931E-02
0.120E+03	0.17288E-02
0.130E+03	0.13924E-02
0.140E+03	0.10563E-02
0.150E+03	0.83806E-03
0.160E+03	0.65293E-03
0.170E+03	0.50068E-03
0.180E+03	0.39871E-03
0.190E+03	0.29776E-03
0.200E+03	0.24103E-03
0.210E+03	0.18486E-03
0.220E+03	0.14445E-03
0.230E+03	0.11352E-03
0.240E+03	0.85903E-04
0.250E+03	0.68860E-04
0.260E+03	0.51819E-04
0.270E+03	0.41313E-04
0.280E+03	0.31926E-04
0.290E+03	0.24514E-04
0.300E+03	0.19344E-04
0.310E+03	0.14413E-04
0.320E+03	0.11518E-04
0.330E+03	0.86704E-05
0.340E+03	0.67149E-05
0.350E+03	0.51462E-05
0.360E+03	0.37975E-05
0.370E+03	0.29334E-05
0.380E+03	0.20693E-05
0.390E+03	0.15650E-05
0.400E+03	0.10890E-05
0.410E+03	0.72886E-06
0.420E+03	0.46669E-06
0.430E+03	0.22311E-06
0.440E+03	0.78499E-07
0.450E+03	0.00000E+00

Hobbs A-6 vent (1R428-59) MultiMed ETHYLBENZENE 02.05.2013 Ipg
0.460E+03 0.00000E+00
0.470E+03 0.00000E+00
0.480E+03 0.00000E+00
0.490E+03 0.00000E+00
0.500E+03 0.00000E+00

Figure 10a

Projected XYLENE Concentration 1m Downgradient from Source
[WQCC Standard is 0.62 mg/l]

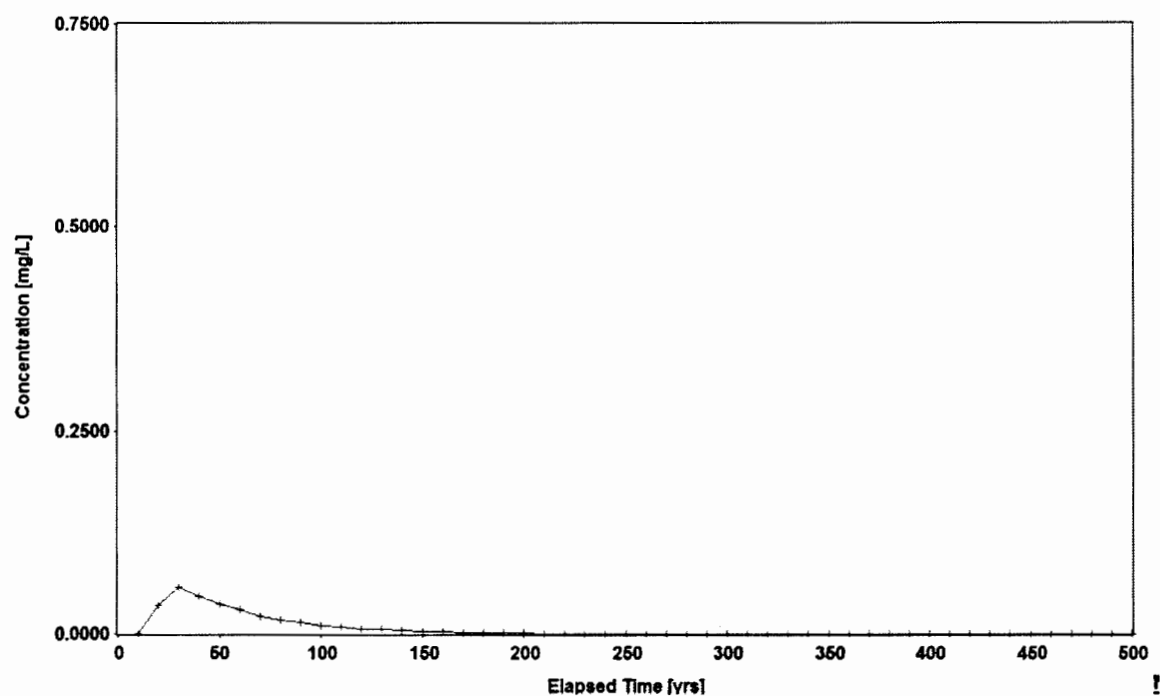


Figure 10b

MULTIMED V1.01 DATE OF CALCULATIONS: Hobbs A-6 vent (1R428-59) MultiMed XYLENE 02.05.2013 .pgg
5-FEB-2013 TIME: 14:43:19

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y
E X P O S U R E A S S E S S M E N T
M U L T I M E D I A M O D E L
MULTIMED (Version 1.50, 2005)

1 Run options

Chemical simulated is XYLENE

Option Chosen Saturated and unsaturated zone models
Run was DETERMIN
Infiltration Specified By User: 3.048E-02 m/yr
Run was transient
Well Times: Entered Explicitly
Reject runs if Y coordinate outside plume
Reject runs if Z coordinate outside plume
Gaussian source used in saturated zone model

1 UNSATURATED ZONE FLOW MODEL PARAMETERS
1 (input parameter description and value)
 NP - Total number of nodal points 240
 NMAT - Number of different porous materials 1
 KPROP - Van Genuchten or Brooks and Corey 1
 IMSHGN - Spatial discretization option 1
 NVFLAYR - Number of layers in flow model 1

OPTIONS CHOSEN

Van Genuchten functional coefficients
User defined coordinate system

1 Layer information
1 -----
 LAYER NO. LAYER THICKNESS MATERIAL PROPERTY

 1 3.35 1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS			LIMITS	
			MEAN	STD	DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.		-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.		-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.		-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	3.35	0.000		0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS			LIMITS	
			MEAN	STD	DEV	MIN	MAX
Residual water content	--	CONSTANT	0.116	-999.		-999.	-999.
Brook and Corey exponent, EN	--	CONSTANT	-999.	-999.		-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.		-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.		-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY - Number of different layers used 1
 NSTPS - Number of time values concentration calc 40
 DUMMY - Not presently used 1
 ISOL - Type of scheme used in unsaturated zone 2
 N - Stehfest terms or number of increments 18
 NTEL - Points in Lagrangian interpolation 3
 NGPTS - Number of Gauss points 104
 NIT - Convolution integral segments 2
 IBOUND - Type of boundary condition 3
 ITSGEN - Time values generated or input 1
 TMAX - Max simulation time --
 WTFUN - Weighting factor 1.2

OPTIONS CHOSEN

 Convolution integral approach
 Exponentially decaying continuous source
 Computer generated times for computing concentrations

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS			LIMITS	
			MEAN	STD	DEV	MIN	MAX
Thickness of layer	m	CONSTANT	3.35	-999.		-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.		-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.		-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.		-999.	-999.

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.250	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.000	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm ² /s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry's law constant	atm-m ³ /M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.305E-01	-999.	-999.	-999.
Area of waste disposal unit	m ²	CONSTANT	25.0	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	10.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.250E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	44.7	-999.	-999.	-999.
Length scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Width scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.86	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	6.10	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.300E-02	-999.	-999.	-999.

Groundwater seepage velocity					
Retardation coefficient	m/yr				
Longitudinal dispersivity	--				
Transverse dispersivity	m				
Vertical dispersivity	m				
Temperature of aquifer	C				
pH	--				
Organic carbon content (fraction)					
Well distance from site	m				
Angle off center	degree				
Well vertical distance	m				

Hobbs A-6 vent (1R428-59) MultiMed XYLENE 02.05.2013

DERIVED	-999.	-999.
DERIVED	-999.	-999.
FUNCTION OF X	-999.	-999.
FUNCTION OF X	-999.	-999.
FUNCTION OF X	-999.	-999.
CONSTANT	20.0	-999.
CONSTANT	7.00	-999.
CONSTANT	0.000	-999.
CONSTANT	1.00	-999.
CONSTANT	0.000	-999.
CONSTANT	0.000	-999.

TIME	CONCENTRATION
0.100E+02	0.52030E-04
0.200E+02	0.34833E-01
0.300E+02	0.56812E-01
0.400E+02	0.45656E-01
0.500E+02	0.36160E-01
0.600E+02	0.28911E-01
0.700E+02	0.21662E-01
0.800E+02	0.17463E-01
0.900E+02	0.13470E-01
0.100E+03	0.10466E-01
0.110E+03	0.82662E-02
0.120E+03	0.62320E-02
0.130E+03	0.50193E-02
0.140E+03	0.38077E-02
0.150E+03	0.30211E-02
0.160E+03	0.23537E-02
0.170E+03	0.18049E-02
0.180E+03	0.14373E-02
0.190E+03	0.10734E-02
0.200E+03	0.86888E-03
0.210E+03	0.66640E-03
0.220E+03	0.52073E-03
0.230E+03	0.40921E-03
0.240E+03	0.30867E-03
0.250E+03	0.24823E-03
0.260E+03	0.18680E-03
0.270E+03	0.14893E-03
0.280E+03	0.11509E-03
0.290E+03	0.88370E-04
0.300E+03	0.69732E-04
0.310E+03	0.51956E-04
0.320E+03	0.41522E-04
0.330E+03	0.31255E-04
0.340E+03	0.24206E-04
0.350E+03	0.18551E-04
0.360E+03	0.13689E-04
0.370E+03	0.10574E-04
0.380E+03	0.74596E-05
0.390E+03	0.56416E-05
0.400E+03	0.39258E-05
0.410E+03	0.26274E-05
0.420E+03	0.16823E-05
0.430E+03	0.80428E-06
0.440E+03	0.28298E-06
0.450E+03	0.00000E+00

Hobbs A-6 vent (1R428-59) MultiMed XYLENE 02.05.2013 lpg

0.460E+03	0.00000E+00
0.470E+03	0.00000E+00
0.480E+03	0.00000E+00
0.490E+03	0.00000E+00
0.500E+03	0.00000E+00

Figure 11

Hobbs A-6 vent (1R428-59)
Unit A, Section 6, T19S, R38E



Facing West

10/10/2012



Facing South

10/10/2012



Figure 12

PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

December 21, 2012

Hack Conder
Rice Operating Company
112 W. Taylor
Hobbs, NM 88240

RE: HOBBS A-6 VENT

Enclosed are the results of analyses for samples received by the laboratory on 12/17/12 12:21.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene
Lab Director/Quality Manager

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received: 12/17/2012
Reported: 12/21/2012
Project Name: HOBBS A-6 VENT
Project Number: NONE GIVEN
Project Location: T19S R38E SEC6 A-LEA CTY., NM

Sampling Date: 12/12/2012
Sampling Type: Water
Sampling Condition: Cool & Intact
Sample Received By: Jodi Henson

Sample ID: MONITOR WELL #1 (H203019-01)

BTX 8021B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	12/17/2012	ND	0.047	94.1	0.0500	11.4	
Toluene*	<0.001	0.001	12/17/2012	ND	0.051	102	0.0500	10.1	
Ethylbenzene*	<0.001	0.001	12/17/2012	ND	0.050	99.1	0.0500	10.2	
Total Xylenes*	<0.003	0.003	12/17/2012	ND	0.151	101	0.150	10.9	
Total BTX	<0.006	0.006	12/17/2012	ND					

Surrogate: 4-Bromofluorobenzene (PIL) 117 % 89.5-126

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	52.0	4.00	12/18/2012	ND	128	128	100	20.7	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	94.0	10.0	12/18/2012	ND	19.4	96.8	20.0	17.5	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	550	5.00	12/18/2012	ND	223	92.9	240	5.13	

TPH 8015M		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<1.00	1.00	12/18/2012	ND	44.8	89.5	50.0	1.17	
DRO >C10-C28	<1.00	1.00	12/18/2012	ND	50.5	101	50.0	0.671	
EXT DRO >C28-C35	<1.00	1.00	12/18/2012	ND	ND		0.00		

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	12/17/2012	Sampling Date:	12/12/2012
Reported:	12/21/2012	Sampling Type:	Water
Project Name:	HOBBS A-6 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S R38E SEC6 A-LEA CTY., NM		

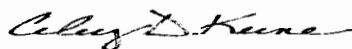
Sample ID: MONITOR WELL #1 (H203019-01)

TPH 8015M	mg/L	Analyzed By: MS							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Surrogate: 1-Chlorooctane	82.7 %	48.7-164							
Surrogate: 1-Chlorooctadecane	95.5 %	54.8-165							

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

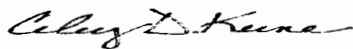
Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

Cardinal Laboratories, Inc. 101 East Marland - Hobbs, New Mexico 88240 Tel (575) 393-2326 Fax (575) 393-2476		CHAIN-OF-CUSTODY AND ANALYSIS REQUEST LAB Order ID # _____																																					
Company Name: RICE Operating Company Project Manager: Hack Conder Address: (Street, City, Zip) 122 W Taylor Street - Hobbs, New Mexico 88240 Phone #: (575) 393-9174 Fax #: (575) 393-9174		ANALYSIS REQUEST (Circle or Specify Method No.)																																					
Project Name: Hobbs A-6 Vent Project Location: T19S R38E Sec 6A ~ Lea County - New Mexico		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7</td> <td style="width:15%;">Total Metals Ag As Ba Cd Cr Pb Se Hg</td> <td style="width:15%;">TCLP Volatiles</td> <td style="width:15%;">TCLP Semi Volatiles</td> <td style="width:15%;">TCLP Pesticides</td> <td style="width:15%;">RCI</td> <td style="width:15%;">GC/MS Vol. 8260B/624</td> <td style="width:15%;">GC/MS Semi. Vol. 8270C/625</td> <td style="width:15%;">PCBs 8082/608</td> <td style="width:15%;">Pesticides 8081A/608</td> <td style="width:15%;">BOD, TSS, pH</td> <td style="width:15%;">Moisture Content</td> <td style="width:15%;">Cations (Ca, Mg, Na, K)</td> <td style="width:15%;">Anions (Cl, SO₄, CO₃, HCO₃)</td> <td style="width:15%;">Sulfates</td> <td style="width:15%;">Total Dissolved Solids</td> <td style="width:15%;">Chlorides</td> <td style="width:15%;">Turn Around Time ~ 24 Hours</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>		Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCBs 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO ₄ , CO ₃ , HCO ₃)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours																		
Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCBs 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO ₄ , CO ₃ , HCO ₃)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours																						
Sampled By: Rozanne Johnson Date: 12-17-2012 Time: 10:10		Received by: Rozanne Johnson Date: 12-17-2012 Time: 10:11																																					
Relinquished by: Rozanne Johnson Date: 12-17-2012 Time: 12:26		Relinquished by: Rozanne Johnson Date: 12-17-2012 Time: 12:26																																					
Delivered By: (Circle One) UPS - Bus - Other:		REMARKS: Email Results to: hconder@riceswd.com rozanne@valornet.com																																					

Katie Jones

From: Hansen, Edward J., EMNRD [edwardj.hansen@state.nm.us]
Sent: Thursday, March 14, 2013 9:44 AM
To: Hack Conder
Cc: Leking, Geoffrey R, EMNRD; Katie Jones; Laura Pena; L Peter Galusky
Subject: Remediation Plan (1R428-59) Further Information Required - ROC Hobbs A-6 Vent Site

Follow Up Flag: Follow up
Flag Status: Flagged

**RE: Remediation Termination Request for the Rice Operating Company's
Hobbs A-6 Vent Site
Unit Letter A, Section 6, T19S, R38E, NMPM, Lea County, New Mexico
Remediation Plan (1R428-59) Further Information Required**

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has received Rice Operating Company's (ROC) report and request to close the above-referenced site (dated February 18, 2013). The report indicates that additional information is required. Therefore, the OCD cannot approved the termination of the remediation plan at this time:

ROC must submit an amended MULTIMED benzene simulation using a dissolved and solid phase decay coefficient value of **0.15** and a mixing zone value of 10 feet (**3.048 m**). Also, please submit an amended MULTIMED chloride simulation using a mixing zone value of **3.048 m**.

If you have any questions regarding this matter, please contact me at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

Katie Jones

From: Katie Jones
Sent: Wednesday, March 27, 2013 3:25 PM
To: 'Hansen, Edward J., EMNRD'
Cc: Hack Conder; Laura Pena; 'L Peter Galusky'
Subject: ROC - Hobbs A-6 vent (1R428-59) Further Information Required - Amended Multimed Files
Attachments: Hobbs A-6 vent (1R428-59) MultiMed Benzene.inp; Hobbs A-6 vent (1R428-59) MultiMed Benzene.out; Hobbs A-6 vent (1R428-59) MultiMed Benzene Graph.pdf; Hobbs A-6 vent (1R428-59) MultiMed Chloride.inp; Hobbs A-6 vent (1R428-59) MultiMed Chloride.out; Hobbs A-6 vent (1R428-59) MultiMed Chloride Graph.pdf; Hobbs A-6 vent (1R428-59) Termination Request 2.18.13.pdf

Mr. Hansen,

Attached are the amended MULTIMED files for benzene and chloride, as requested. The maximum projected benzene concentration is 0.006595 mg/L at year 30 and the maximum chloride concentration is 53.17 mg/L at year 20. Both of these concentrations are below the respective groundwater thresholds. Also, attached is the Termination Request previously submitted to OCD on February 18, 2013. Based on these amended MULTIMED files, ROC requests termination of the regulatory file or similar closure status. If you have any questions or require any additional information, please contact Hack Conder at (575)393-9174.

Thank you,

Katie Jones
Environmental Project Manager
RICE Operating Company

From: Hansen, Edward J., EMNRD [<mailto:edwardj.hansen@state.nm.us>]
Sent: Thursday, March 14, 2013 9:44 AM
To: Hack Conder
Cc: Leking, Geoffrey R, EMNRD; Katie Jones; Laura Pena; L Peter Galusky
Subject: Remediation Plan (1R428-59) Further Information Required - ROC Hobbs A-6 Vent Site

**RE: Remediation Termination Request for the Rice Operating Company's
Hobbs A-6 Vent Site
Unit Letter A, Section 6, T19S, R38E, NMPM, Lea County, New Mexico
Remediation Plan (1R428-59) Further Information Required**

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has received Rice Operating Company's (ROC) report and request to close the above-referenced site (dated February 18, 2013). The report indicates that additional information is required. Therefore, the OCD cannot approved the termination of the remediation plan at this time:

ROC must submit an amended MULTIMED benzene simulation using a dissolved and solid phase decay coefficient value of **0.15** and a mixing zone value of 10 feet (**3.048 m**). Also, please submit an amended MULTIMED chloride simulation using a mixing zone value of **3.048 m**.

If you have any questions regarding this matter, please contact me at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

MULTIMED V1.01 DATE OF CALCULATIONS: 20-MAR-2013 TIME: 13: 6:10
Hobbs A-6 vent (IR428-59) Multimed Chloride
U. S. ENVIRONMENTAL PROTECTION AGENCY
EXPOSURE ASSESSMENT
MULTIMEDIA MODEL
MULTIMED (Version 1.50, 2005)

1 Run options

Chemical simulated is Chloride

Option Chosen Saturated and unsaturated zone models

Run was DETERMIN

Infiltration Specified By User: 3.048E-02 m/yr

Run was transient

Well Times: Entered Explicitly

Reject runs if Y coordinate outside plume

Reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1 1

UNSATURATED ZONE FLOW MODEL PARAMETERS
(input parameter description and value)
NP - Total number of nodal points 240
NMAT - Number of different porous materials 1
KPROP - Van Genuchten or Brooks and Corey 1
IMSHGN - Spatial discretization option 1
NVEFLAYR - Number of layers in flow model 1

OPTIONS CHOSEN

Van Genuchten functional coefficients

User defined coordinate system

1

Layer information

LAYER NO. LAYER THICKNESS MATERIAL PROPERTY

1 2.00 1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

Hobbs A-6 vent (1R428-59) Multimed Chloride

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	2.00	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.116	-999.	-999.	-999.
Brook and Corey exponent,EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY - Number of different layers used 1
 NTSTPS - Number of time values concentration calc 40
 DUMMY - Not presently used 1
 ISOL - Type of scheme used in unsaturated zone 2
 N - Stehfest terms or number of increments 18
 NTEL - Points in Lagrangian interpolation 3
 NGPTS - Number of Gauss points 104
 NIT - Convolution integral segments 2
 IBOUND - Type of boundary condition 3
 ITSGEN - Time values generated or input 1
 TMAX - Max simulation time 0.0
 WTFUN - weighting factor 1.2

OPTIONS CHOSEN

Convolution integral approach
 Exponentially decaying continuous source
 Computer generated times for computing concentrations

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	2.00	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.	-999.	-999.

Page 2

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.
Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.
Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.000	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.
Air diffusion coefficient	cm ² /s	CONSTANT	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.
Henry's law constant	atm-m ³ /M	CONSTANT	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000
Not currently used		CONSTANT	0.000	0.000	0.000

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN MAX
Infiltration rate	m/yr	CONSTANT	0.305E-01	-999.	-999.
Area of waste disposal unit	m ²	CONSTANT	25.0	-999.	-999.
Duration of pulse	yr	DERIVED	10.0	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.250E-01	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	598.	-999.	-999.
Length scale of facility	m	DERIVED	1.00	-999.	-999.
Width scale of facility	m	DERIVED	1.00	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	1.00

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	LIMITS MIN MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.
Bulk density	g/cc	CONSTANT	1.86	-999.	-999.
Aquifer thickness	m	CONSTANT	6.10	-999.	-999.
Source thickness (mixing zone depth)	m	CONSTANT	3.05	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.300E-02	-999.	-999.

Hobbs A-6 vent (1R428-59) Multimed Chloride
0.460E+03 0.11458E-02
0.470E+03 0.88442E-03
0.480E+03 0.68090E-03
0.490E+03 0.54027E-03
0.500E+03 0.39965E-03

MULTIMED V1.01 DATE OF CALCULATIONS: 19-MAR-2013 TIME: 14:53:51 Hobbs A-6 vent (1R428-59) Multimed Benzene

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.50, 2005)

1 Run options
--- -----

Chemical simulated is BENZENE

Option Chosen Saturated and unsaturated zone models

Run was DETERMIN

Infiltration Specified By User: 3.048E-02 m/yr

Run was transient

Well Times: Entered Explicitly

Reject runs if y coordinate outside plume

Reject runs if z coordinate outside plume

Gaussian source used in saturated zone model

1 1

UNSATURATED ZONE FLOW MODEL PARAMETERS

(input parameter description and value)

NP - Total number of nodal points 240

NMAT - Number of different porous materials 1

KPROP - Van Genuchten or Brooks and Corey 1

IMSHGN - Spatial discretization option 1

NVFLAYR - Number of layers in flow model 1

OPTIONS CHOSEN

Van Genuchten functional coefficients

User defined coordinate system

1

Layer information

LAYER NO.	LAYER THICKNESS	MATERIAL PROPERTY
1	3.35	1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	Hobbs A-6 vent (1R428-59) UNITS	DISTRIBUTION	Multimed Benzene PARAMETERS			LIMITS	
			MEAN	STD DEV	MIN	MAX	
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.	
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.	
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.	
Depth of the unsaturated zone	m	CONSTANT	3.35	0.000	0.000	0.000	

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.116	-999.	-999.	-999.
Brook and Corey exponent, EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	-999.	-999.

1 UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

- NLAY - Number of different layers used 1
- NTSTPS - Number of time values concentration calc 40
- DUMMY - Not presently used 1
- ISOL - Type of scheme used in unsaturated zone 2
- N - Stehfest terms or number of increments 18
- NTEL - Points in Lagrangian interpolation 3
- NGPTS - Number of Gauss points 104
- NIT - Convolution integral segments 2
- IBOUND - Type of boundary condition 3
- ITSGEN - Time values generated or input 1
- TMAX - Max simulation time 0.0
- WTFUN - Weighting factor 1.2

OPTIONS CHOSEN

Convolution integral approach
Exponentially decaying continuous source
Computer generated times for computing concentrations
1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	3.35	-999.	-999.	-999.
Longitudinal dispersivity of layer	-	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	-	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.	-999.	-999.

Biological decay coefficient Hobbs A-6 vent (1R428-59) Multimed Benzene -999. -999. -999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.150	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.150	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.000	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm ² /s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry's law constant	atm-m ³ /M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.305E-01	-999.	-999.	-999.
Area of waste disposal unit	m ²	CONSTANT	25.0	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	10.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.250E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	2.78	-999.	-999.	-999.
Length scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Width scale of facility	m	DERIVED	1.00	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.86	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	6.10	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	CONSTANT	3.05	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.300E-02	-999.	-999.	-999.

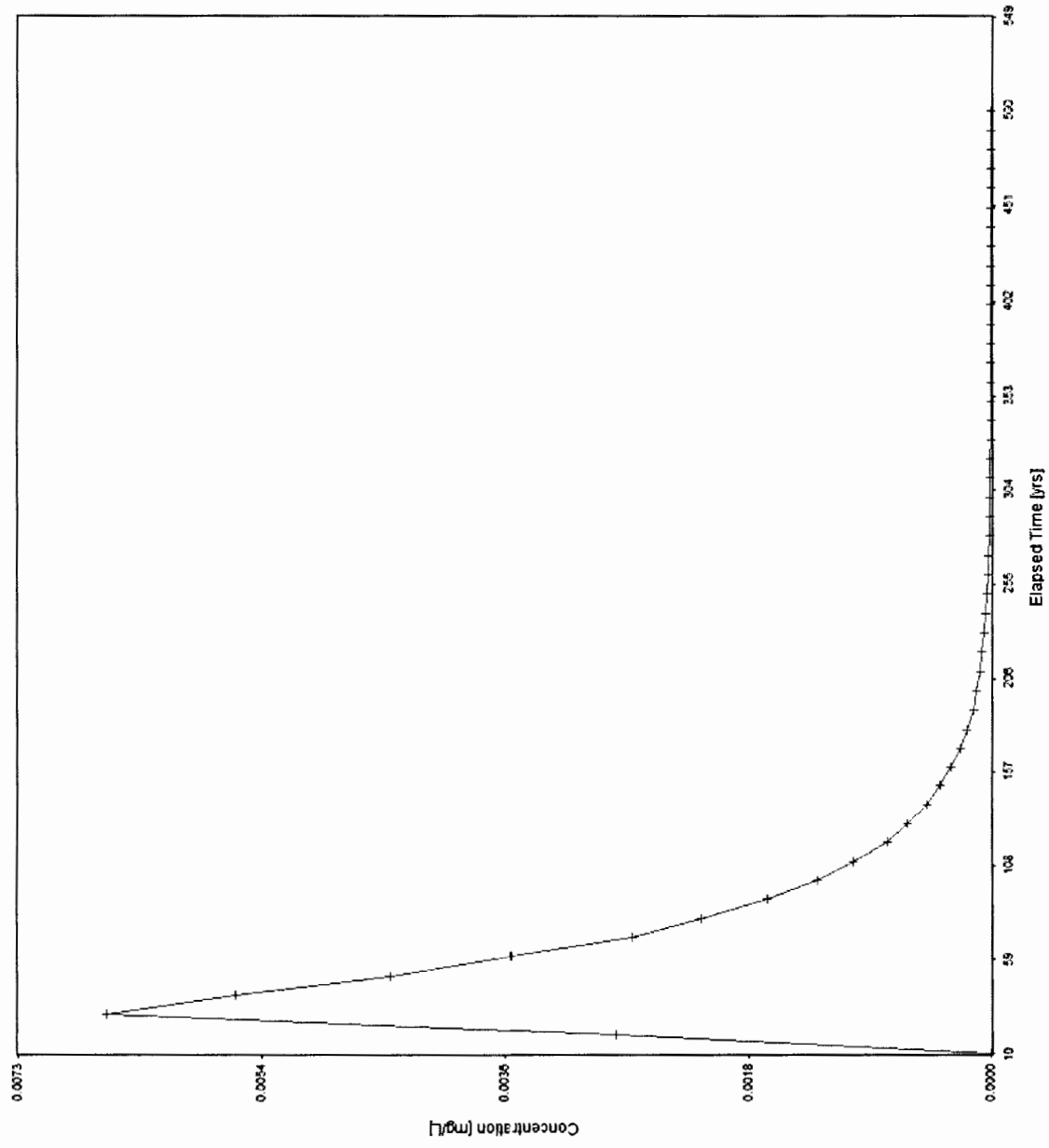
	Hobbs A-6	vent (1R428-59)	MultiMed Benzene
Groundwater seepage velocity	m/yr	DERIVED	-999.
Retardation coefficient	--	DERIVED	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.
Vertical dispersivity	m	FUNCTION OF X	-999.
Temperature of aquifer	C	CONSTANT	20.0
pH	--	CONSTANT	7.00
Organic carbon content (fraction)		CONSTANT	0.000
well distance from site	m	CONSTANT	1.00
Angle off center	degree	CONSTANT	0.000
well vertical distance	m	CONSTANT	0.000

TIME	CONCENTRATION	
0	1.00E+02	0.20621E-05
0	2.00E+02	0.28002E-02
0	3.00E+02	0.05948E-02
0	4.00E+02	0.56354E-02
0	5.00E+02	0.44765E-02
0	6.00E+02	0.35794E-02
0	7.00E+02	0.26823E-02
0	8.00E+02	0.21624E-02
0	9.00E+02	0.16680E-02
0	1.00E+03	0.12960E-02
0	1.10E+03	0.10237E-02
0	1.20E+03	0.77182E-03
0	1.30E+03	0.62166E-03
0	1.40E+03	0.47164E-03
0	1.50E+03	0.37242E-03
0	1.60E+03	0.29161E-03
0	1.70E+03	0.22365E-03
0	1.80E+03	0.17814E-03
0	1.90E+03	0.13308E-03
0	2.00E+03	0.10776E-03
0	2.10E+03	0.82685E-04
0	2.20E+03	0.64648E-04
0	2.30E+03	0.50838E-04
0	2.40E+03	0.38513E-04
0	2.50E+03	0.30906E-04
0	2.60E+03	0.23300E-04
0	2.70E+03	0.18611E-04
0	2.80E+03	0.14421E-04
0	2.90E+03	0.11131E-04
0	3.00E+03	0.88049E-05
0	3.10E+03	0.66039E-05
0	3.20E+03	0.53119E-05
0	3.30E+03	0.40407E-05
0	3.40E+03	0.31679E-05
0	3.50E+03	0.24677E-05
0	3.60E+03	0.18657E-05
0	3.70E+03	0.14800E-05
0	3.80E+03	0.10943E-05
0	3.90E+03	0.86924E-06
0	4.00E+03	0.65680E-06
0	4.10E+03	0.49603E-06
0	4.20E+03	0.37901E-06
0	4.30E+03	0.27029E-06
0	4.40E+03	0.20574E-06
0	4.50E+03	0.14129E-06

Hobbs A-6 vent (1R428-59) Multimed Benzene
0.460E+03 0.99147E-07
0.470E+03 0.63643E-07
0.480E+03 0.34286E-07
0.490E+03 0.14729E-07
0.500E+03 0.00000E+00

Hobbs A-6 vent (1R428-59)

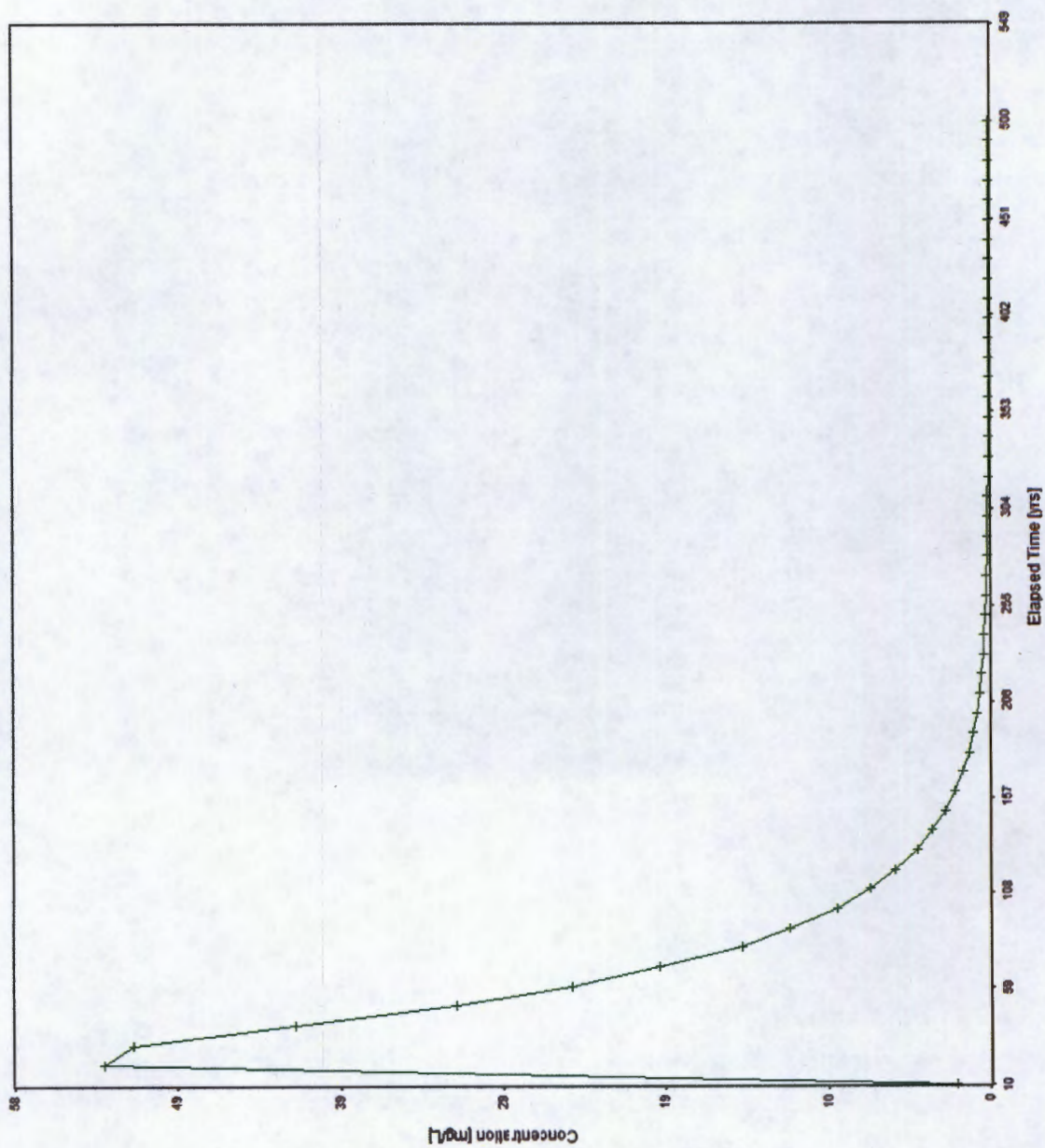
BENZENE Concentration At The Receptor Well



+ BENZENE

Hobbs A-6 vent (1R428-59)

Chloride Concentration At The Receptor Well



+ Chloride