Appendix F Attachment 2

Emissions Potential Analysis

GeoSyntec Consultants

1. EMISSIONS POTENTIAL ANALYSIS

Waste materials at the Site are primarily impacted with petroleum hydrocarbons. The evaluation of remedial alternatives needs to consider potential emissions of volatile chemicals and odors from these waste materials. For remedial alternatives that involve excavation or disturbance of waste materials, emissions shall not present unacceptable human health risks or nuisances to potential receptors at the property perimeter. In addition, compliance with anticipated South Coast Air Quality Management District (SCAQMD) permit requirements for organic vapor emissions will be required.

1.1 Technical Approach

Dispersion modeling was performed using conservative wind data to estimate the transport of chemicals. Site specific data on the flux rate of volatile chemicals and odor from waste materials were used in conjunction with the dispersion modeling results to evaluate potential ambient air impacts. Ambient air concentrations of chemicals and odors were predicted for excavations of varying area. Results were then compared to risk-based and other threshold values.

The evaluations were conducted using excavation scenarios of approximately 1,500 cubic yards per day of varying depth, which resulted in a range of maximum exposed waste surface area per day. The three excavation scenarios used in the ambient air prediction calculations are:

- Scenario 1 - 2,500 square feet,
- Scenario 2 - 5,000 square feet, and
- Scenario 3 - 7,500 square feet.

Given the relatively large size of the Site, waste materials may be excavated at varying distances from the property perimeter. Therefore, exposure point concentrations were evaluated at varying distances from the source. Receptor distances of 100, 300, 600, and 1,000 feet were evaluated for each excavation scenario. Details regarding each of the calculation steps are presented in the following sections.

1.2 Threshold Criteria

The estimated receptor concentrations were compared to specific threshold criteria. For specific chemical concentrations, risk based criteria that are protective of human of health were used. For each excavation and receptor distance scenario, conservative maximum hourly average and maximum annual average exposure point concentrations were calculated. Acute risk-based criteria were used for comparison to maximum hourly average (short term) concentrations. Intermediate or chronic exposure-based values were used for comparison to maximum annual average (long term) concentrations. Risk-based comparison criteria used in this evaluation are presented in Table F2-1.

Maximum estimated exposure point odor concentrations were compared to a threshold odor dilution to threshold (D/T) ratio of 7. The D/T ratio of 7 has been defined by C.E. Schmidt and others as an appropriate "impact level" for applications at similar sites [C.E. Schmidt, et al, 1991]. Finally, in addition to chemical specific concentrations and nuisance odors, anticipated SCAQMD permit conditions were evaluated. According to the SCAQMD permit obtained for the Pilot Study No. 3 investigations, maximum allowable organic vapor analyzer (OVA) concentrations were not to exceed 0.5 ppm above background at the property perimeter.

1.3 Dispersion Modeling

Atmospheric dispersion modeling was performed to simulate the downwind transport of chemicals released during the excavation of waste materials at the Site. Because the various waste streams contain differing levels of constituents, the modeling was performed for varying exposed surface areas to allow airborne pollutant concentration estimates to be made from each waste stream under different excavation scenarios.

The modeling was performed using the EPA-approved Industrial Source Complex Short Term 3 (ISCST3) model [EPA, 1995]. This model has also been approved for use by the SCAQMD in modeling area source emissions in relative flat terrain. This mathematical model estimates dilution of emissions by diffusion and

turbulent mixing with clean air as they move away from a source downwind. The model predicts concentrations from various source types at numerous specified locations of interest, or potential receptors.

The modeling was performed for three different source areas--2,500 ft^2, 5,000 ft^2, and 7,500 ft^2--to simulate varying excavation approaches. Each source was modeled as an area source with a release height of zero. To estimate concentrations at varying distances, a polar receptor grid was developed with receptors located at approximately 100 ft, 300 ft, 600 ft, and 1,000 ft from each source location in radial directions that were 10 degrees apart from each other.

As required by the ISCST3 model, hourly meteorological data were used. The 1981 hourly meteorological data set from the SCAQMD Costa Mesa Monitoring Site was used for the modeling effort. This data set has been developed, reviewed and approved for use in modeling evaluations by the SCAQMD. The data set is representative of the meteorological conditions at the Site and represents typical coastal conditions for this region [SCAQMD, 2004]. Continuous on-Site meteorological data was collected from March 18, 2004, through July 23, 2004, as part of Pilot Study No. 3 activities. A comparison of wind conditions was performed between the on-Site meteorological data and the same time period of the SCAQMD Costa Mesa data set. The on-Site data show predominant winds from the west and west-southwest. The Costa Mesa data show predominant winds from the west-southwest and the southwest. Wind speeds from the Costa Mesa data set are lower than those in the onsite data set for the same time period, and, therefore, result in more conservative model predictions.

Unit emissions of 1 gram per second (g/s) for every source were used in the model to calculate dispersion factors in units of micrograms per cubic meter per 1 g/s emissions ($[\mu g/m^3]/[g/s]$) from each area source under each excavation scenario. These dispersion factors are then multiplied by the estimated source emissions (g/s) of each chemical to calculate downwind pollutant specific concentrations from the Site under each excavation scenario. Model output datasheets are provided as an attachment. For each receptor distance the maximum dispersion factor was used for calculation of receptor concentrations. This approach also results in more conservative modeled predictions.

1.4 Source Flux Rates

Down-hole and surface chamber flux testing were performed on each of the waste types as part of Pilot Study No. 3 field activities. Details regarding the collection of flux chamber test data are provided in Appendix D and Attachment F1 of Appendix F of the RFS. Flux testing included collection of composite vapor flux samples for laboratory testing of VOCs and odors. Flux testing results were grouped based one of several waste stream designations in which the test was conducted including:

- Drilling muds (DM),
- Drilling muds with high liquids (DMHL),
- Fill materials (Fill),
- Impacted soils (IS),
- Styrene-impacted materials near Pit F (Styrene), and
- Native soils (Native).

It should be noted that down-hole flux testing results from native soils appear to have been affected from overlying drill muds with high VOC content. Therefore, the longer term steady state emissions from native soils in close proximity to waste are likely significantly less than calculated using these flux data. Laboratory results of samples were used in conjunction with flux chamber testing flow rates and chamber size to calculate emission rates of specific chemicals in units of mass per square meter per minute. Average and maximum chemical emission rates for each waste stream were then calculated from the individual sample data. Chemical specific and odor data per waste stream are shown in Tables F2-2 and F2-3, respectively.

For all waste streams, a range of OVA measurements up to 50 ppmv as measured 3-inches above the material surface (per SCAQMD requirements) were evaluated. Due to the SCAQMD requirement of limiting surface emissions above 50 ppmv, greater OVA emissions were not evaluated. Given that OVA measurements are concentrations, it was necessary to convert these values to representative mass flux values per unit area and time.

The waste stream specific source flux rates for each excavation scenario were then calculated by multiplying the average and maximum unit area flux rates for

each waste stream by the excavation area specific to each scenario. This calculation results in total mass of chemical emitted from the excavation area per unit time.

1.5 Estimation of Exposure Point Concentrations

Maximum exposure point concentrations are estimated for potential receptors at distances of 100, 300, 600, and 1,000 feet from excavation areas. Conservative maximum exposure point concentrations are calculated at these distances for each of the three excavation scenarios. As a result of variations in wind speed and direction, dispersion modeling results for each excavation scenario and receptor distance also consider both average hourly (short term) and annual average (long term) atmospheric transport conditions.

Maximum average hourly (short term) and maximum average annual (long term) exposure point concentrations for specific chemicals are estimated by multiplying the area-weighted flux values by the most conservative (maximum) hourly average and annual average dispersion factors derived for each excavation scenario and receptor distance combination. Given that dispersion modeling was performed using a polar receptor grid with receptors located in 360 degree directions, multiple dispersion factors were calculated for each receptor distance. Conservative exposure point estimates are derived by using the highest (maximum) dispersion factor calculated for each receptor distance. The specific dispersion factors used in the calculations for each distance and excavation scenario are listed in Table F2-4. Estimated short and long term chemical specific exposure point concentrations at varying distances for each excavation scenario are presented in Tables F2-5 through F2-10. Estimated short and long term odor concentrations for excavation scenarios 1, 2, and 3 are presented in Tables F2-11 through F2-13, respectively. Indicated on these tables is whether or not the threshold value is exceeded.

Estimated exposure point concentrations were compared to respective threshold levels. For specific chemicals, either short term (acute) or long term (chronic) risk-based levels were used. Estimated short term and long term exposure point odor levels were compared to a D/T threshold of 7. If the predicted exposure point concentrations exceed the threshold values, the estimated percent exceedance of the threshold value was calculated.

Specifically, for benzene and ethylbenzene, emissions from drill muds and styrene wastes were shown to have the greatest potential to exceed threshold levels. For compounds that were shown to exceed threshold levels, the effectiveness of foam emission controls was evaluated. Tables F2-6 and F2-10 include estimated short term receptor concentrations assuming foam emissions control efficiency of 90-percent for Scenarios 1 and 3, respectively. The impact of foams on odor concentrations was also evaluated in a similar manner. Tables F2-11 and F2-12 include estimated short term odor concentrations assuming foam emission control efficiency of 90-percent for Scenarios 1 and 3, respectively.

Estimates of OVA concentrations from excavation surface emissions were also evaluated. OVA measurements of up to 50 ppmv as measured 3-inches above the soil surface were evaluated for short-term conditions for excavation scenarios 1 and 3. Table F2-14 includes estimates of OVA concentrations at distances of 100, 300, 600, and 1,000 feet from source areas. As shown on Table F2-14, if OVA emissions from excavation and stockpile surfaces are limited to 50 ppmv, OVA concentrations at distances as short as 100 feet should not exceed the 0.5 ppmv threshold value.

1.6 Findings

As expected, estimated annual hourly or short term concentrations are greater than the annual average or long term concentrations for similar scenarios and distances. In addition, with increasing excavation area, predicted concentrations of specific chemicals and odor increase proportionally. Based on the modeling and calculations performed, specific key findings include:

- Odor concentrations have the highest potential to exceed threshold levels at receptor locations,

- If OVA emissions from stockpiles and excavation surfaces are limited to 50 ppmv, anticipated SCAQMD property line threshold values of 0.5 ppmv should not be exceeded,

- Waste streams that resulted in estimated exceedances of specific chemicals were the drilling mud, drilling mud with high liquids, and styrene. In several instances emission from native material resulted in exceedances. However, the flux data assigned to this material is likely not representative of true vapor conditions due to the close proximity of overlying impacted drilling mud,

- Nearly all exceedances of threshold criteria for specific chemicals are due to benzene. Ethylbenzene was the only other chemical where estimated exposure point concentrations exceeded threshold criteria,

- With respect to the excavation area of 2,500 ft^2, average benzene emissions from drilling muds at distances of 300 feet or less appear to require use of controls such as foams. Average benzene emissions from drilling muds at distances greater than 300 feet do not appear to require any special controls. At a distance of 100 feet, average benzene emissions likely require mitigation measures beyond use of foams or suppressants or a reduction in exposed surface area by at least a factor of two.

- For the 2,500 ft^2 excavation area, maximum benzene and ethylbenzene chemical emissions from waste streams can be controlled using foams with control efficiencies of approximately 90 percent.

- For the 7,500 ft^2 excavation area the use of suppressant foams can likely address the average benzene and ethylbenzene chemical emissions from drilling muds and styrene wastes. However, further evaluation or controls may be required to mitigate the maximum emission of these chemicals measured from these waste types.

- Based on the conservative calculations performed, it appears that short term odors may be problematic at times during excavation of drill muds, fill, and styrene waste. Further evaluation of potential odor emissions and the use of engineered controls may be required, particularly at distances of 300 feet or less from the property line.

References

C.E. Schmidt, et al, 1991, “Development of an Engineering Approach for the Remediation of a Petroleum Sump and the Measurement and Modeling of Air Emissions from the Remedial Approach,” June 1991.

U.S. Environmental Protection Agency. 1995. User's Guide for the Industrial Source Complex (ISC3) Dispersion Models - User's Instructions. September.

SCAQMD, 2004, Download of Costa Mesa meteorological data set; http://www.aqmd.gov/smog/metdata/MetDataTable1.html

Table F2-1
Risk Based Comparison Criteria
Ambient Air Emissions -- Ascon Landfill Site

CHEMICAL	COMPARISON CRITERIA					
	California OEHHA			ATSDR		
	REL (ppbv)	REL (ug/m3)	Type	MRL (ppbv)	MRL (ug/m3)	Type
1,1,1-Trichloroethane	12,500	6.80E+04	acute	200	1.09E+03	acute
	183	1.00E+03	chronic	700	3.82E+03	int
1,2-Dichloroethane				600	2.43E+03	chronic
1,3-Butadiene	9.04	20	chronic	NA	NA	NA
2-Butanone (MEK)	4408	1.30E+04	acute	NA	NA	NA
	321	1.00E+03	chronic	NA	NA	NA
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	26000	6.18E+04	acute
	NA	NA	NA	13000	3.09E+04	int/chr
Benzene	400	1.30E+03	acute	50	1.60E+02	acute
	18.8	6.00E+01	chronic	4	1.28E+01	int
Carbon Disulfide	1990	6.20E+03	acute	300	9.34E+02	chronic
	257	8.00E+02	chronic	NA	NA	NA
Chlorobenzene	217	1.00E+03	chronic	NA	NA	NA
Ethylbenzene	460	2.00E+03	chronic	1000	4.34E+03	int
Methylene Chloride	4030	1.40E+04	acute	600	2.08E+03	acute
	115	4.00E+02	chronic	300	1.04E+03	int
Styrene	4932	2.10E+04	acute	60	2.55E+02	chronic
	297	9.00E+02	chronic	NA	NA	NA
Toluene	9818	3.70E+04	acute	1000.0	3.77E+03	acute
	80	3.00E+02	chronic	80	3.01E+02	chronic
Trichlorofluoromethane	NA	NA	NA	NA	NA	NA
Vinyl Acetate	56.9	200	chronic	10	3.50E+01	int
Xylenes	5065	2.20E+04	acute	1000	4.34E+03	acute
	161	7.00E+02	chronic	700	3.04E+03	int
Fuel Oil No. 2					2.00E+01	acute

Notes: (1) NA = Not Available
(2) OEHHA REL = California Office of Environmental Health Hazard Assessment Reference Exposure Levels
(3) ATSDR MRL = Agency for Toxic Substances and Disease Registry Minimal Risk Levels
(4) The above list will be expanded based on actual sampling and analytical results.
(5) ATSDR exposure durations
acute exposures 1 - 14 days
int - intermediate exposures >14 - 364 days
chronic - exposures > 365 days

Table F2-2

Dispersion Modeling Results Summary

Ambient Air Emissions

Ascon Landfill Site

Scenario 1 - 2,500 ft^2 Excavation Area

Receptor Distance (ft)	Selected Dispersion Factors [1]	
	Annual Avg. (long term)	Hourly Avg. (short term)
100	4,038	64,564
300	788	42,805
600	243	25,477
1,000	101	16,680

Scenario 2 - 5,000 ft^2 Excavation Area

Receptor Distance (ft)	Selected Dispersion Factors [1]	
	Annual Avg. (long term)	Hourly Avg. (short term)
100	3,068	46,781
300	730	37,282
600	233	24,208
1,000	98	16,193

Scenario 3 - 7,500 ft^2 Excavation Area

Receptor Distance (ft)	Selected Dispersion Factors [1]	
	Annual Avg. (long term)	Hourly Avg. (short term)
100	2,671	38,322
300	677	33,217
600	225	23,219
1,000	97	15,843

1) Value is the highest dispersion factor from all calculated nodes for each scenario

Table F2-3

Chemical Specific Source Flux Values

Ambient Air Emissions -- Ascon Landfill Site

Chemicals	Waste Type	Source Values Flux (ug/m2-min) Avg	Max
2-Butanone (MEK)	DM	7.3	20
Acetone	DM	4.5	14.1
Benzene	DM	1514	6573
Carbon Disulfide	DM	2.56	1.5
Dichloromethane (Methylene Chloride)	DM	4.1	11.9
Ethylbenzene	DM	816	11000
m,p-Xylenes	DM	1972	7825
o-Xylene	DM	879	3756
Toluene	DM	1752	10329
1,3-Butadiene	DMHL	12.4	43.8
2-Butanone (MEK)	DMHL	18.9	34.4
Benzene	DMHL	1403	2817
Carbon Disulfide	DMHL	5.7	11.3
Chlorobenzene	DMHL	11.9	28.8
Dichloromethane (Methylene Chloride)	DMHL	24.0	56.3
Ethylbenzene	DMHL	849	2567
m,p-Xylenes	DMHL	1119	3130
o-Xylene	DMHL	321	657
Styrene	DMHL	24.1	87.6
Toluene	DMHL	472	1659
1,3-Butadiene	FILL	2.4	4.1
2-Butanone (MEK)	FILL	5.7	16.0
Acetone	FILL	5.8	28.5
Benzene	FILL	11.1	40.7
Carbon Disulfide	FILL	2.5	4.1
Dichloromethane (Methylene Chloride)	FILL	2.3	11.3
Ethylbenzene	FILL	119	250
m,p-Xylenes	FILL	25.2	59.5
o-Xylene	FILL	10.0	31.3
Styrene	FILL	1.0	1.6
Toluene	FILL	8.8	26.9
2-Butanone (MEK)	IS	1.4	2.6
Benzene	IS	0.56	0.97
Carbon Disulfide	IS	0.40	0.66
Ethylbenzene	IS	0.45	0.78
m,p-Xylenes	IS	0.8	1.3
o-Xylene	IS	0.50	0.88
Toluene	IS	0.53	0.94
Benzene	NATIVE**	2927	4695
Ethylbenzene	NATIVE**	39501	78250
m,p-Xylenes	NATIVE**	470	908
o-Xylene	NATIVE**	210	407
Toluene	NATIVE**	1789	3443
2-Butanone (MEK)	STYRENE	5.52	3.8
Acetone	STYRENE	129	501
Benzene	STYRENE	3774	10955
Ethylbenzene	STYRENE	11284	28483
o-Xylene	STYRENE	3.48	3.4
Styrene	STYRENE	90	344
Toluene	STYRENE	1101	3099
Vinyl Acetate	STYRENE	21.44	7.8

**Note: Native Clay Sample results may be affected by overlying drilling muds with high volatile content (See PNL-7-21 DHF results).

Does not included detected Sulfur Compounds

Table F2-4

Source Flux Values - Odor Concentration
Ambient Air Emissions -- Ascon Landfill Site

Waste Stream	Source Values Flux ((D/T)/m2-min)	
	Avg	Max
Drill Mud	1,210	2,602
Drill Mud - High Liquid	3,137	7,903
Fill	385	385
Impacted Soil	15	18
Native	744	1,549
Styrene Impacted	460	667
Oil	31	89

Note:
Odor concentration expressed in terms of dilution to threshold (D/T)

Table F2-5

Calculated Annual Average (long term) Exposure Concentrations
Maximum and Average Chemical Specific Source Flux
Scenario 1 - 2,500 ft^2 Excavation Area

Chemicals	Source Values			Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Annual Average Concentrations (ug/m3) - Long Term Exposure								Chronic Threshold Values MRL or REL (ug/m3)	Potential Exceedances?
	Waste Type	Flux (ug/m2-min)		100 ft		300 ft		600 ft		1,000 ft			
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max		
2-Butanone (MEK)	DM	7.3	20	1.14E-01	3.13E-01	2.23E-02	6.10E-02	6.87E-03	1.88E-02	2.86E-03	7.82E-03	1.00E+03	no
Acetone	DM	4.5	14.1	7.01E-02	2.20E-01	1.37E-02	4.30E-02	4.22E-03	1.33E-02	1.75E-03	5.51E-03	3.09E+04	no
Benzene	DM	1514	6573	2.37E+01	1.03E+02	4.62E+00	2.00E+01	1.42E+00	6.18E+00	5.92E-01	2.57E+00	1.28E+01	**yes**
Carbon Disulfide	DM	2.56	1.5	4.01E-02	2.34E-02	7.82E-03	4.57E-03	2.41E-03	1.41E-03	1.00E-03	5.86E-04	8.00E+02	no
Dichloromethane (Methylene Chloride)	DM	4.1	11.9	6.46E-02	1.86E-01	1.26E-02	3.63E-02	3.88E-03	1.12E-02	1.61E-03	4.65E-03	4.00E+02	no
Ethylbenzene	DM	816	11000	1.28E+01	1.72E+02	2.49E+00	3.35E+01	7.67E-01	1.03E+01	3.19E-01	4.30E+00	2.00E+03	no
m,p-Xylenes	DM	1972	7825	3.08E+01	1.22E+02	6.01E+00	2.39E+01	1.85E+00	7.36E+00	7.71E-01	3.06E+00	7.00E+02	no
o-Xylene	DM	879	3756	1.37E+01	5.87E+01	2.68E+00	1.15E+01	8.27E-01	3.53E+00	3.44E-01	1.47E+00	7.00E+02	no
Toluene	DM	1752	10329	2.74E+01	1.61E+02	5.34E+00	3.15E+01	1.65E+00	9.71E+00	6.85E-01	4.04E+00	3.00E+02	no
1,3-Butadiene	DMHL	12.4	43.8	1.94E-01	6.84E-01	3.78E-02	1.34E-01	1.17E-02	4.12E-02	4.84E-03	1.71E-02	2.00E+01	no
2-Butanone (MEK)	DMHL	18.9	34.4	2.95E-01	5.38E-01	5.75E-02	1.05E-01	1.77E-02	3.24E-02	7.37E-03	1.34E-02	1.00E+03	no
Benzene	DMHL	1403	2817	2.19E+01	4.40E+01	4.28E+00	8.59E+00	1.32E+00	2.65E+00	5.48E-01	1.10E+00	1.28E+01	**yes**
Carbon Disulfide	DMHL	5.7	11.3	8.85E-02	1.77E-01	1.73E-02	3.45E-02	5.33E-03	1.06E-02	2.21E-03	4.42E-03	8.00E+02	no
Chlorobenzene	DMHL	11.9	28.8	1.86E-01	4.50E-01	3.64E-02	8.78E-02	1.12E-02	2.71E-02	4.66E-03	1.13E-02	1.00E+03	no
Dichloromethane (Methylene Chloride)	DMHL	24.0	56.3	3.75E-01	8.80E-01	7.33E-02	1.72E-01	2.26E-02	5.29E-02	9.39E-03	2.20E-02	4.00E+02	no
Ethylbenzene	DMHL	849	2567	1.33E+01	4.01E+01	2.59E+00	7.83E+00	7.98E-01	2.41E+00	3.32E-01	1.00E+00	2.00E+03	no
m,p-Xylenes	DMHL	1119	3130	1.75E+01	4.89E+01	3.41E+00	9.55E+00	1.05E+00	2.94E+00	4.37E-01	1.22E+00	7.00E+02	no
o-Xylene	DMHL	321	657	5.01E+00	1.03E+01	9.79E-01	2.00E+00	3.02E-01	6.18E-01	1.25E-01	2.57E-01	7.00E+02	no
Styrene	DMHL	24.1	87.6	3.76E-01	1.37E+00	7.34E-02	2.67E-01	2.26E-02	8.24E-02	9.41E-03	3.42E-02	9.00E+02	no
Toluene	DMHL	472	1659	7.37E+00	2.59E+01	1.44E+00	5.06E+00	4.44E-01	1.56E+00	1.84E-01	6.48E-01	3.00E+02	no
1,3-Butadiene	FILL	2.4	4.1	3.70E-02	6.41E-02	7.22E-03	1.25E-02	2.23E-03	3.86E-03	9.25E-04	1.60E-03	2.00E+01	no
2-Butanone (MEK)	FILL	5.7	16.0	8.90E-02	2.50E-01	1.74E-02	4.88E-02	5.35E-03	1.50E-02	2.23E-03	6.25E-03	1.00E+03	no
Acetone	FILL	5.8	28.5	8.99E-02	4.45E-01	1.76E-02	8.69E-02	5.41E-03	2.68E-02	2.25E-03	1.11E-02	3.09E+04	no
Benzene	FILL	11.1	40.7	1.73E-01	6.36E-01	3.37E-02	1.24E-01	1.04E-02	3.83E-02	4.32E-03	1.59E-02	1.28E+01	no
Carbon Disulfide	FILL	2.5	4.1	3.85E-02	6.41E-02	7.52E-03	1.25E-02	2.32E-03	3.86E-03	9.64E-04	1.60E-03	8.00E+02	no
Dichloromethane (Methylene Chloride)	FILL	2.3	11.3	3.61E-02	1.77E-01	7.04E-03	3.45E-02	2.17E-03	1.06E-02	9.03E-04	4.42E-03	4.00E+02	no
Ethylbenzene	FILL	119	250	1.85E+00	3.91E+00	3.61E-01	7.62E-01	1.11E-01	2.35E-01	4.63E-02	9.77E-02	2.00E+03	no
m,p-Xylenes	FILL	25.2	59.5	3.94E-01	9.30E-01	7.69E-02	1.81E-01	2.37E-02	5.60E-02	9.86E-03	2.33E-02	7.00E+02	no
o-Xylene	FILL	10.0	31.3	1.56E-01	4.89E-01	3.04E-02	9.55E-02	9.38E-03	2.94E-02	3.90E-03	1.22E-02	7.00E+02	no
Styrene	FILL	1.0	1.6	1.54E-02	2.50E-02	3.00E-03	4.88E-03	9.26E-04	1.50E-03	3.85E-04	6.25E-04	9.00E+02	no
Toluene	FILL	8.8	26.9	1.38E-01	4.20E-01	2.69E-02	8.20E-02	8.30E-03	2.53E-02	3.45E-03	1.05E-02	3.00E+02	no
2-Butanone (MEK)	IS	1.4	2.6	2.18E-02	4.06E-02	4.25E-03	7.93E-03	1.31E-03	2.45E-03	5.44E-04	1.02E-03	1.00E+03	no
Benzene	IS	0.56	0.97	8.80E-03	1.52E-02	1.72E-03	2.96E-03	5.30E-04	9.12E-04	2.20E-04	3.79E-04	1.28E+01	no
Carbon Disulfide	IS	0.40	0.66	6.30E-03	1.03E-02	1.23E-03	2.01E-03	3.79E-04	6.21E-04	1.58E-04	2.58E-04	8.00E+02	no
Ethylbenzene	IS	0.45	0.78	7.07E-03	1.22E-02	1.38E-03	2.38E-03	4.25E-04	7.34E-04	1.77E-04	3.05E-04	2.00E+03	no
m,p-Xylenes	IS	0.8	1.3	1.30E-02	2.03E-02	2.53E-03	3.96E-03	7.80E-04	1.22E-03	3.24E-04	5.08E-04	7.00E+02	no
o-Xylene	IS	0.50	0.88	7.80E-03	1.38E-02	1.52E-03	2.68E-03	4.69E-04	8.28E-04	1.95E-04	3.44E-04	7.00E+02	no
Toluene	IS	0.53	0.94	8.29E-03	1.47E-02	1.62E-03	2.87E-03	4.99E-04	8.84E-04	2.07E-04	3.67E-04	3.00E+02	no
Benzene	NATIVE**	2927	4695	4.57E+01	7.34E+01	8.92E+00	1.43E+01	2.75E+00	4.42E+00	1.14E+00	1.84E+00	1.28E+01	**yes**
Ethylbenzene	NATIVE**	39501	78250	6.17E+02	1.22E+03	1.20E+02	2.39E+02	3.71E+01	7.36E+01	1.54E+01	3.06E+01	2.00E+03	no
m,p-Xylenes	NATIVE**	470	908	7.34E+00	1.42E+01	1.43E+00	2.77E+00	4.42E-01	8.54E-01	1.84E-01	3.55E-01	7.00E+02	no
o-Xylene	NATIVE**	210	407	3.28E+00	6.36E+00	6.40E-01	1.24E+00	1.97E-01	3.83E-01	8.20E-02	1.59E-01	7.00E+02	no
Toluene	NATIVE**	1789	3443	2.80E+01	5.38E+01	5.46E+00	1.05E+01	1.68E+00	3.24E+00	6.99E-01	1.35E+00	3.00E+02	no
2-Butanone (MEK)	STYRENE	5.52	3.8	8.62E-02	5.94E-02	1.68E-02	1.16E-02	5.19E-03	3.57E-03	2.16E-03	1.49E-03	1.00E+03	no
Acetone	STYRENE	129	501	2.01E+00	7.83E+00	3.92E-01	1.53E+00	1.21E-01	4.71E-01	5.02E-02	1.96E-01	3.09E+04	no
Benzene	STYRENE	3774	10955	5.90E+01	1.71E+02	1.15E+01	3.34E+01	3.55E+00	1.03E+01	1.47E+00	4.28E+00	1.28E+01	**yes**
Ethylbenzene	STYRENE	11284	28483	1.76E+02	4.45E+02	3.44E+01	8.69E+01	1.06E+01	2.68E+01	4.41E+00	1.11E+01	2.00E+03	no
o-Xylene	STYRENE	3.48	3.4	5.44E-02	5.31E-02	1.06E-02	1.04E-02	3.27E-03	3.20E-03	1.36E-03	1.33E-03	7.00E+02	no
Styrene	STYRENE	90	344	1.41E+00	5.38E+00	2.75E-01	1.05E+00	8.49E-02	3.24E-01	3.53E-02	1.34E-01	9.00E+02	no
Toluene	STYRENE	1101	3099	1.72E+01	4.84E+01	3.36E+00	9.45E+00	1.03E+00	2.91E+00	4.30E-01	1.21E+00	3.00E+02	no
Vinyl Acetate	STYRENE	21.44	7.8	3.35E-01	1.22E-01	6.54E-02	2.38E-02	2.02E-02	7.34E-03	8.38E-03	3.05E-03	3.50E+01	no

Estimated Percent Threshold Exceedance							
100 feet		300 feet		600 feet		1,000 feet	
avg	max	avg	max	avg	max	avg	max
85%	**702%**		57%				
71%	**244%**						
257%	**473%**		12%				
361%	**1237%**		**161%**				

**Note: Native Clay Sample results may be affected by overlying drilling muds with high volatile content (See PNL-7-21 DHF results).
Does not included detected Sulfur Compounds

Table F2-6

Calculated Hourly Average (short term) Exposure Concentrations
Maximum and Average Chemical Specific Source Flux
Scenario 1 - 2,500 ft^2 Excavation Area

Chemicals	Source Values			Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Hourly Average Concentrations (ug/m3) - Short Term Exposure								Chronic Threshold Values MRL or REL (ug/m3)	Potential Exceedances?	Estimated Percent Threshold Exceedance							
	Waste Type	Flux (ug/m2-min)		100 ft		300 ft		600 ft		1,000 ft				100 feet		300 feet		600 feet		1,000 feet	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max			avg	max	avg	max	avg	max	avg	max
2-Butanone (MEK)	DM	7.3	20	1.83E+00	5.00E+00	1.21E+00	3.31E+00	7.20E-01	1.97E+00	4.72E-01	1.29E+00	1.30E+04	no								
Acetone	DM	4.5	14.1	1.12E+00	3.52E+00	7.43E-01	2.34E+00	4.42E-01	1.39E+00	2.89E-01	9.10E-01	6.18E+04	no								
Benzene	DM	1514	6573	3.78E+02	1.64E+03	2.51E+02	1.09E+03	1.49E+02	6.48E+02	9.78E+01	4.24E+02	1.60E+02	**yes**	**137%**	**926%**	57%	**581%**		**305%**		**165%**
Carbon Disulfide	DM	2.56	1.5	6.41E-01	3.75E-01	4.25E-01	2.48E-01	2.53E-01	1.48E-01	1.65E-01	9.68E-02	6.20E+03	no								
Dichloromethane (Methylene Chloride)	DM	4.1	11.9	1.03E+00	2.97E+00	6.84E-01	1.97E+00	4.07E-01	1.17E+00	2.67E-01	7.68E-01	2.08E+03	no								
Ethylbenzene	DM	816	11000	2.04E+02	2.75E+03	1.35E+02	1.82E+03	8.05E+01	1.08E+03	5.27E+01	7.10E+02	4.34E+03	no								
m,p-Xylenes	DM	1972	7825	4.93E+02	1.96E+03	3.27E+02	1.30E+03	1.94E+02	7.72E+02	1.27E+02	5.05E+02	4.34E+03	no								
o-Xylene	DM	879	3756	2.20E+02	9.38E+02	1.46E+02	6.22E+02	8.67E+01	3.70E+02	5.68E+01	2.42E+02	4.34E+03	no								
Toluene	DM	1752	10329	4.38E+02	2.58E+03	2.90E+02	1.71E+03	1.73E+02	1.02E+03	1.13E+02	6.67E+02	3.70E+04	no								
1,3-Butadiene	DMHL	12.4	43.8	3.10E+00	1.09E+01	2.05E+00	7.26E+00	1.22E+00	4.32E+00	8.00E-01	2.83E+00	2.00E+01	no								
2-Butanone (MEK)	DMHL	18.9	34.4	4.71E+00	8.60E+00	3.12E+00	5.70E+00	1.86E+00	3.39E+00	1.22E+00	2.22E+00	1.30E+04	no								
Benzene	DMHL	1403	2817	3.51E+02	7.04E+02	2.32E+02	4.67E+02	1.38E+02	2.78E+02	9.06E+01	1.82E+02	1.60E+02	**yes**	**119%**	**340%**	45%	**192%**		74%		14%
Carbon Disulfide	DMHL	5.7	11.3	1.42E+00	2.82E+00	9.38E-01	1.87E+00	5.59E-01	1.11E+00	3.66E-01	7.29E-01	6.20E+03	no								
Chlorobenzene	DMHL	11.9	28.8	2.98E+00	7.20E+00	1.98E+00	4.77E+00	1.18E+00	2.84E+00	7.70E-01	1.86E+00	1.00E+03	no								
Dichloromethane (Methylene Chloride)	DMHL	24.0	56.3	6.00E+00	1.41E+01	3.98E+00	9.33E+00	2.37E+00	5.55E+00	1.55E+00	3.63E+00	2.08E+03	no								
Ethylbenzene	DMHL	849	2567	2.12E+02	6.41E+02	1.41E+02	4.25E+02	8.37E+01	2.53E+02	5.48E+01	1.66E+02	4.34E+03	no								
m,p-Xylenes	DMHL	1119	3130	2.80E+02	7.82E+02	1.85E+02	5.19E+02	1.10E+02	3.09E+02	7.22E+01	2.02E+02	4.34E+03	no								
o-Xylene	DMHL	321	657	8.02E+01	1.64E+02	5.32E+01	1.09E+02	3.16E+01	6.48E+01	2.07E+01	4.24E+01	4.34E+03	no								
Styrene	DMHL	24.1	87.6	6.01E+00	2.19E+01	3.99E+00	1.45E+01	2.37E+00	8.64E+00	1.55E+00	5.65E+00	2.10E+04	no								
Toluene	DMHL	472	1659	1.18E+02	4.15E+02	7.81E+01	2.75E+02	4.65E+01	1.64E+02	3.04E+01	1.07E+02	3.70E+04	no								
1,3-Butadiene	FILL	2.4	4.1	5.91E-01	1.02E+00	3.92E-01	6.79E-01	2.33E-01	4.04E-01	1.53E-01	2.65E-01	2.00E+01	no								
2-Butanone (MEK)	FILL	5.7	16.0	1.42E+00	4.00E+00	9.43E-01	2.65E+00	5.61E-01	1.58E+00	3.68E-01	1.03E+00	1.30E+04	no								
Acetone	FILL	5.8	28.5	1.44E+00	7.12E+00	9.53E-01	4.72E+00	5.67E-01	2.81E+00	3.72E-01	1.84E+00	6.18E+04	no								
Benzene	FILL	11.1	40.7	2.76E+00	1.02E+01	1.83E+00	6.74E+00	1.09E+00	4.01E+00	7.13E-01	2.63E+00	1.60E+02	no								
Carbon Disulfide	FILL	2.5	4.1	6.16E-01	1.02E+00	4.09E-01	6.79E-01	2.43E-01	4.04E-01	1.59E-01	2.65E-01	6.20E+03	no								
Dichloromethane (Methylene Chloride)	FILL	2.3	11.3	5.77E-01	2.82E+00	3.83E-01	1.87E+00	2.28E-01	1.11E+00	1.49E-01	7.29E-01	2.08E+03	no								
Ethylbenzene	FILL	119	250	2.96E+01	6.25E+01	1.96E+01	4.14E+01	1.17E+01	2.46E+01	7.65E+00	1.61E+01	4.34E+03	no								
m,p-Xylenes	FILL	25.2	59.5	6.30E+00	1.49E+01	4.18E+00	9.86E+00	2.49E+00	5.87E+00	1.63E+00	3.84E+00	4.34E+03	no								
o-Xylene	FILL	10.0	31.3	2.49E+00	7.82E+00	1.65E+00	5.19E+00	9.84E-01	3.09E+00	6.44E-01	2.02E+00	4.34E+03	no								
Styrene	FILL	1.0	1.6	2.46E-01	4.00E-01	1.63E-01	2.65E-01	9.71E-02	1.58E-01	6.36E-02	1.03E-01	2.10E+04	no								
Toluene	FILL	8.8	26.9	2.21E+00	6.72E+00	1.46E+00	4.46E+00	8.70E-01	2.65E+00	5.70E-01	1.74E+00	3.70E+04	no								
2-Butanone (MEK)	IS	1.4	2.6	3.48E-01	6.50E-01	2.31E-01	4.31E-01	1.37E-01	2.56E-01	8.99E-02	1.68E-01	1.30E+04	no								
Benzene	IS	0.56	0.97	1.41E-01	2.42E-01	9.33E-02	1.61E-01	5.55E-02	9.56E-02	3.64E-02	6.26E-02	1.60E+02	no								
Carbon Disulfide	IS	0.40	0.66	1.01E-01	1.65E-01	6.68E-02	1.09E-01	3.97E-02	6.51E-02	2.60E-02	4.26E-02	6.20E+03	no								
Ethylbenzene	IS	0.45	0.78	1.13E-01	1.95E-01	7.49E-02	1.29E-01	4.46E-02	7.69E-02	2.92E-02	5.04E-02	4.34E+03	no								
m,p-Xylenes	IS	0.8	1.3	2.07E-01	3.25E-01	1.37E-01	2.15E-01	8.18E-02	1.28E-01	5.35E-02	8.39E-02	4.34E+03	no								
o-Xylene	IS	0.50	0.88	1.25E-01	2.20E-01	8.27E-02	1.46E-01	4.92E-02	8.68E-02	3.22E-02	5.68E-02	4.34E+03	no								
Toluene	IS	0.53	0.94	1.33E-01	2.35E-01	8.79E-02	1.56E-01	5.23E-02	9.27E-02	3.42E-02	6.07E-02	3.70E+04	no								
Benzene	NATIVE**	2927	4695	7.31E+02	1.17E+03	4.85E+02	7.78E+02	2.89E+02	4.63E+02	1.89E+02	3.03E+02	1.60E+02	**yes**	**357%**	**633%**	**203%**	**386%**	80%	**189%**	18%	**89%**
Ethylbenzene	NATIVE**	39501	78250	9.87E+03	1.96E+04	6.54E+03	1.30E+04	3.89E+03	7.72E+03	2.55E+03	5.05E+03	4.34E+03	**yes**	**127%**	**351%**	51%	**199%**		78%		16%
m,p-Xylenes	NATIVE**	470	908	1.17E+02	2.27E+02	7.78E+01	1.50E+02	4.63E+01	8.95E+01	3.03E+01	5.86E+01	4.34E+03	no								
o-Xylene	NATIVE**	210	407	5.24E+01	1.02E+02	3.48E+01	6.74E+01	2.07E+01	4.01E+01	1.35E+01	2.63E+01	4.34E+03	no								
Toluene	NATIVE**	1789	3443	4.47E+02	8.60E+02	2.96E+02	5.70E+02	1.76E+02	3.39E+02	1.15E+02	2.22E+02	3.70E+04	no								
2-Butanone (MEK)	STYRENE	5.52	3.8	1.38E+00	9.49E-01	9.14E-01	6.29E-01	5.44E-01	3.75E-01	3.56E-01	2.45E-01	1.30E+04	no								
Acetone	STYRENE	129	501	3.21E+01	1.25E+02	2.13E+01	8.30E+01	1.27E+01	4.94E+01	8.30E+00	3.23E+01	6.18E+04	no								
Benzene	STYRENE	3774	10955	9.43E+02	2.74E+03	6.25E+02	1.81E+03	3.72E+02	1.08E+03	2.44E+02	7.07E+02	1.60E+02	**yes**	**489%**	**1611%**	**291%**	**1034%**	**133%**	**575%**	52%	**342%**
Ethylbenzene	STYRENE	11284	28483	2.82E+03	7.12E+03	1.87E+03	4.72E+03	1.11E+03	2.81E+03	7.28E+02	1.84E+03	4.34E+03	**yes**		64%		9%				
o-Xylene	STYRENE	3.48	3.4	8.70E-01	8.50E-01	5.77E-01	5.63E-01	3.43E-01	3.35E-01	2.25E-01	2.19E-01	4.34E+03	no								
Styrene	STYRENE	90	344	2.26E+01	8.60E+01	1.50E+01	5.70E+01	8.90E+00	3.39E+01	5.83E+00	2.22E+01	2.10E+04	no								
Toluene	STYRENE	1101	3099	2.75E+02	7.74E+02	1.82E+02	5.13E+02	1.09E+02	3.06E+02	7.10E+01	2.00E+02	3.70E+04	no								
Vinyl Acetate	STYRENE	21.44	7.8	5.36E+00	1.95E+00	3.55E+00	1.29E+00	2.11E+00	7.69E-01	1.38E+00	5.04E-01	3.50E+01	no								

**Note: Native Clay Sample results may be affected by overlying drilling muds with high volatile content (See PNL-7-21 DHF results).
Does not included detected Sulfur Compounds

Table F2-7

Calculated Annual Average (long term) Exposure Concentrations
Maximum and Average Chemical Specific Source Flux
Scenario 2 - 5,000 ft^2 Excavation Area

Chemicals	Source Values			Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Annual Average Concentrations (ug/m3) - Long Term Exposure								Chronic Threshold Values MRL or REL (ug/m3)	Potential Exceedances?	Estimated Percent Threshold Exceedance							
	Waste Type	Flux (ug/m2-min)		100 ft		300 ft		600 ft		1,000 ft				100 feet		300 feet		600 feet		1,000 feet	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max			avg	max	avg	max	avg	max	avg	max
2-Butanone (MEK)	DM	7.3	20	1.73E-01	4.75E-01	4.13E-02	1.13E-01	1.32E-02	3.61E-02	5.54E-03	1.52E-02	1.00E+03	no								
Acetone	DM	4.5	14.1	1.06E-01	3.35E-01	2.53E-02	7.97E-02	8.08E-03	2.54E-02	3.40E-03	1.07E-02	3.09E+04	no								
Benzene	DM	1514	6573	3.60E+01	1.56E+02	8.56E+00	3.71E+01	2.73E+00	1.19E+01	1.15E+00	4.99E+00	1.28E+01	**yes**	**181%**	**1119%**		**190%**				
Carbon Disulfide	DM	2.56	1.5	6.09E-02	3.56E-02	1.45E-02	8.48E-03	4.62E-03	2.71E-03	1.94E-03	1.14E-03	8.00E+02	no								
Dichloromethane (Methylene Chloride)	DM	4.1	11.9	9.81E-02	2.83E-01	2.33E-02	6.72E-02	7.45E-03	2.15E-02	3.13E-03	9.03E-03	4.00E+02	no								
Ethylbenzene	DM	816	11000	1.94E+01	2.61E+02	4.61E+00	6.22E+01	1.47E+00	1.98E+01	6.19E-01	8.34E+00	2.00E+03	no								
m,p-Xylenes	DM	1972	7825	4.68E+01	1.86E+02	1.11E+01	4.42E+01	3.56E+00	1.41E+01	1.50E+00	5.94E+00	7.00E+02	no								
o-Xylene	DM	879	3756	2.09E+01	8.92E+01	4.97E+00	2.12E+01	1.59E+00	6.77E+00	6.67E-01	2.85E+00	7.00E+02	no								
Toluene	DM	1752	10329	4.16E+01	2.45E+02	9.90E+00	5.84E+01	3.16E+00	1.86E+01	1.33E+00	7.83E+00	3.00E+02	no								
1,3-Butadiene	DMHL	12.4	43.8	2.94E-01	1.04E+00	7.00E-02	2.47E-01	2.24E-02	7.90E-02	9.40E-03	3.32E-02	2.00E+01	no								
2-Butanone (MEK)	DMHL	18.9	34.4	4.48E-01	8.17E-01	1.07E-01	1.94E-01	3.40E-02	6.20E-02	1.43E-02	2.61E-02	1.00E+03	no								
Benzene	DMHL	1403	2817	3.33E+01	6.69E+01	7.93E+00	1.59E+01	2.53E+00	5.08E+00	1.06E+00	2.14E+00	1.28E+01	**yes**	**160%**	**423%**		24%				
Carbon Disulfide	DMHL	5.7	11.3	1.35E-01	2.68E-01	3.20E-02	6.38E-02	1.02E-02	2.04E-02	4.30E-03	8.57E-03	8.00E+02	no								
Chlorobenzene	DMHL	11.9	28.8	2.83E-01	6.84E-01	6.74E-02	1.63E-01	2.15E-02	5.19E-02	9.05E-03	2.18E-02	1.00E+03	no								
Dichloromethane (Methylene Chloride)	DMHL	24.0	56.3	5.70E-01	1.34E+00	1.36E-01	3.18E-01	4.33E-02	1.02E-01	1.82E-02	4.27E-02	4.00E+02	no								
Ethylbenzene	DMHL	849	2567	2.02E+01	6.10E+01	4.80E+00	1.45E+01	1.53E+00	4.63E+00	6.44E-01	1.95E+00	2.00E+03	no								
m,p-Xylenes	DMHL	1119	3130	2.66E+01	7.43E+01	6.32E+00	1.77E+01	2.02E+00	5.64E+00	8.49E-01	2.37E+00	7.00E+02	no								
o-Xylene	DMHL	321	657	7.62E+00	1.56E+01	1.81E+00	3.71E+00	5.79E-01	1.18E+00	2.43E-01	4.98E-01	7.00E+02	no								
Styrene	DMHL	24.1	87.6	5.72E-01	2.08E+00	1.36E-01	4.95E-01	4.34E-02	1.58E-01	1.83E-02	6.64E-02	9.00E+02	no								
Toluene	DMHL	472	1659	1.12E+01	3.94E+01	2.67E+00	9.37E+00	8.51E-01	2.99E+00	3.58E-01	1.26E+00	3.00E+02	no								
1,3-Butadiene	FILL	2.4	4.1	5.62E-02	9.74E-02	1.34E-02	2.32E-02	4.27E-03	7.39E-03	1.79E-03	3.11E-03	2.00E+01	no								
2-Butanone (MEK)	FILL	5.7	16.0	1.35E-01	3.80E-01	3.22E-02	9.04E-02	1.03E-02	2.89E-02	4.32E-03	1.21E-02	1.00E+03	no								
Acetone	FILL	5.8	28.5	1.37E-01	6.77E-01	3.25E-02	1.61E-01	1.04E-02	5.14E-02	4.37E-03	2.16E-02	3.09E+04	no								
Benzene	FILL	11.1	40.7	2.62E-01	9.66E-01	6.24E-02	2.30E-01	1.99E-02	7.34E-02	8.38E-03	3.09E-02	1.28E+01	no								
Carbon Disulfide	FILL	2.5	4.1	5.86E-02	9.74E-02	1.39E-02	2.32E-02	4.45E-03	7.39E-03	1.87E-03	3.11E-03	8.00E+02	no								
Dichloromethane (Methylene Chloride)	FILL	2.3	11.3	5.48E-02	2.68E-01	1.30E-02	6.38E-02	4.16E-03	2.04E-02	1.75E-03	8.57E-03	4.00E+02	no								
Ethylbenzene	FILL	119	250	2.81E+00	5.94E+00	6.70E-01	1.41E+00	2.14E-01	4.51E-01	8.99E-02	1.90E-01	2.00E+03	no								
m,p-Xylenes	FILL	25.2	59.5	5.99E-01	1.41E+00	1.43E-01	3.36E-01	4.55E-02	1.07E-01	1.91E-02	4.51E-02	7.00E+02	no								
o-Xylene	FILL	10.0	31.3	2.37E-01	7.43E-01	5.64E-02	1.77E-01	1.80E-02	5.64E-02	7.57E-03	2.37E-02	7.00E+02	no								
Styrene	FILL	1.0	1.6	2.34E-02	3.80E-02	5.56E-03	9.04E-03	1.78E-03	2.89E-03	7.47E-04	1.21E-03	9.00E+02	no								
Toluene	FILL	8.8	26.9	2.10E-01	6.39E-01	4.99E-02	1.52E-01	1.59E-02	4.85E-02	6.70E-03	2.04E-02	3.00E+02	no								
2-Butanone (MEK)	IS	1.4	2.6	3.31E-02	6.17E-02	7.87E-03	1.47E-02	2.51E-03	4.69E-03	1.06E-03	1.97E-03	1.00E+03	no								
Benzene	IS	0.56	0.97	1.34E-02	2.30E-02	3.18E-03	5.48E-03	1.02E-03	1.75E-03	4.27E-04	7.36E-04	1.28E+01	no								
Carbon Disulfide	IS	0.40	0.66	9.57E-03	1.57E-02	2.28E-03	3.73E-03	7.27E-04	1.19E-03	3.06E-04	5.01E-04	8.00E+02	no								
Ethylbenzene	IS	0.45	0.78	1.07E-02	1.85E-02	2.56E-03	4.41E-03	8.16E-04	1.41E-03	3.43E-04	5.92E-04	2.00E+03	no								
m,p-Xylenes	IS	0.8	1.3	1.97E-02	3.09E-02	4.69E-03	7.35E-03	1.50E-03	2.34E-03	6.29E-04	9.86E-04	7.00E+02	no								
o-Xylene	IS	0.50	0.88	1.19E-02	2.09E-02	2.82E-03	4.97E-03	9.00E-04	1.59E-03	3.79E-04	6.67E-04	7.00E+02	no								
Toluene	IS	0.53	0.94	1.26E-02	2.23E-02	3.00E-03	5.31E-03	9.57E-04	1.70E-03	4.02E-04	7.13E-04	3.00E+02	no								
Benzene	NATIVE**	2927	4695	6.95E+01	1.11E+02	1.65E+01	2.65E+01	5.28E+00	8.47E+00	2.22E+00	3.56E+00	1.28E+01	**yes**	**443%**	**771%**	29%	**107%**				
Ethylbenzene	NATIVE**	39501	78250	9.38E+02	1.86E+03	2.23E+02	4.42E+02	7.12E+01	1.41E+02	3.00E+01	5.94E+01	2.00E+03	no								
m,p-Xylenes	NATIVE**	470	908	1.11E+01	2.16E+01	2.65E+00	5.13E+00	8.47E-01	1.64E+00	3.56E-01	6.89E-01	7.00E+02	no								
o-Xylene	NATIVE**	210	407	4.98E+00	9.66E+00	1.19E+00	2.30E+00	3.78E-01	7.34E-01	1.59E-01	3.09E-01	7.00E+02	no								
Toluene	NATIVE**	1789	3443	4.25E+01	8.18E+01	1.01E+01	1.95E+01	3.23E+00	6.21E+00	1.36E+00	2.61E+00	3.00E+02	no								
2-Butanone (MEK)	STYRENE	5.52	3.8	1.31E-01	9.02E-02	3.12E-02	2.15E-02	9.95E-03	6.85E-03	4.18E-03	2.88E-03	1.00E+03	no								
Acetone	STYRENE	129	501	3.05E+00	1.19E+01	7.26E-01	2.83E+00	2.32E-01	9.04E-01	9.75E-02	3.80E-01	3.09E+04	no								
Benzene	STYRENE	3774	10955	8.96E+01	2.60E+02	2.13E+01	6.19E+01	6.81E+00	1.98E+01	2.86E+00	8.31E+00	1.28E+01	**yes**	**600%**	**1932%**	67%	**384%**		54%		
Ethylbenzene	STYRENE	11284	28483	2.68E+02	6.76E+02	6.38E+01	1.61E+02	2.03E+01	5.14E+01	8.56E+00	2.16E+01	2.00E+03	no								
o-Xylene	STYRENE	3.48	3.4	8.27E-02	8.07E-02	1.97E-02	1.92E-02	6.28E-03	6.13E-03	2.64E-03	2.58E-03	7.00E+02	no								
Styrene	STYRENE	90	344	2.14E+00	8.17E+00	5.10E-01	1.94E+00	1.63E-01	6.20E-01	6.85E-02	2.61E-01	9.00E+02	no								
Toluene	STYRENE	1101	3099	2.61E+01	7.36E+01	6.22E+00	1.75E+01	1.98E+00	5.59E+00	8.35E-01	2.35E+00	3.00E+02	no								
Vinyl Acetate	STYRENE	21.44	7.8	5.09E-01	1.85E-01	1.21E-01	4.41E-02	3.87E-02	1.41E-02	1.63E-02	5.92E-03	3.50E+01	no								

**Note: Native Clay Sample results may be affected by overlying drilling muds with high volatile content (See PNL-7-21 DHF results).
Does not included detected Sulfur Compounds

Table F2-8

Calculated Hourly Average (short term) Exposure Concentrations
Maximum and Average Chemical Specific Source Flux
Scenario 2 - 5,000 ft^2 Excavation Area

Chemicals	Source Values			Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Hourly Average Concentrations (ug/m3) - Short Term Exposure								Chronic Threshold Values MRL or REL (ug/m3)	Potential Exceedances?	Estimated Percent Threshold Exceedance							
	Waste Type	Flux (ug/m2-min)		100 ft		300 ft		600 ft		1,000 ft				100 feet		300 feet		600 feet		1,000 feet	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max			avg	max	avg	max	avg	max	avg	max
2-Butanone (MEK)	DM	7.3	20	2.65E+00	7.24E+00	2.11E+00	5.77E+00	1.37E+00	3.75E+00	9.16E-01	2.51E+00	1.30E+04	no								
Acetone	DM	4.5	14.1	1.62E+00	5.11E+00	1.29E+00	4.07E+00	8.40E-01	2.64E+00	5.62E-01	1.77E+00	6.18E+04	no								
Benzene	DM	1514	6573	5.48E+02	2.38E+03	4.37E+02	1.90E+03	2.84E+02	1.23E+03	1.90E+02	8.24E+02	1.60E+02	**yes**	**243%**	**1387%**	**173%**	**1085%**	77%	**670%**	19%	**415%**
Carbon Disulfide	DM	2.56	1.5	9.28E-01	5.43E-01	7.40E-01	4.33E-01	4.80E-01	2.81E-01	3.21E-01	1.88E-01	6.20E+03	no								
Dichloromethane (Methylene Chloride)	DM	4.1	11.9	1.50E+00	4.31E+00	1.19E+00	3.43E+00	7.74E-01	2.23E+00	5.18E-01	1.49E+00	2.08E+03	no								
Ethylbenzene	DM	816	11000	2.95E+02	3.98E+03	2.35E+02	3.17E+03	1.53E+02	2.06E+03	1.02E+02	1.38E+03	4.34E+03	no								
m,p-Xylenes	DM	1972	7825	7.14E+02	2.83E+03	5.69E+02	2.26E+03	3.69E+02	1.47E+03	2.47E+02	9.81E+02	4.34E+03	no								
o-Xylene	DM	879	3756	3.18E+02	1.36E+03	2.54E+02	1.08E+03	1.65E+02	7.04E+02	1.10E+02	4.71E+02	4.34E+03	no								
Toluene	DM	1752	10329	6.34E+02	3.74E+03	5.05E+02	2.98E+03	3.28E+02	1.94E+03	2.20E+02	1.29E+03	3.70E+04	no								
1,3-Butadiene	DMHL	12.4	43.8	4.49E+00	1.59E+01	3.58E+00	1.26E+01	2.32E+00	8.21E+00	1.55E+00	5.49E+00	2.00E+01	no								
2-Butanone (MEK)	DMHL	18.9	34.4	6.83E+00	1.25E+01	5.44E+00	9.93E+00	3.53E+00	6.45E+00	2.36E+00	4.31E+00	1.30E+04	no								
Benzene	DMHL	1403	2817	5.08E+02	1.02E+03	4.05E+02	8.13E+02	2.63E+02	5.28E+02	1.76E+02	3.53E+02	1.60E+02	**yes**	**218%**	**537%**	**153%**	**408%**	64%	**230%**	10%	**121%**
Carbon Disulfide	DMHL	5.7	11.3	2.05E+00	4.09E+00	1.63E+00	3.26E+00	1.06E+00	2.12E+00	7.10E-01	1.42E+00	6.20E+03	no								
Chlorobenzene	DMHL	11.9	28.8	4.32E+00	1.04E+01	3.44E+00	8.31E+00	2.23E+00	5.40E+00	1.49E+00	3.61E+00	1.00E+03	no								
Dichloromethane (Methylene Chloride)	DMHL	24.0	56.3	8.70E+00	2.04E+01	6.93E+00	1.62E+01	4.50E+00	1.05E+01	3.01E+00	7.06E+00	2.08E+03	no								
Ethylbenzene	DMHL	849	2567	3.07E+02	9.29E+02	2.45E+02	7.41E+02	1.59E+02	4.81E+02	1.06E+02	3.22E+02	4.34E+03	no								
m,p-Xylenes	DMHL	1119	3130	4.05E+02	1.13E+03	3.23E+02	9.03E+02	2.10E+02	5.86E+02	1.40E+02	3.92E+02	4.34E+03	no								
o-Xylene	DMHL	321	657	1.16E+02	2.38E+02	9.26E+01	1.90E+02	6.01E+01	1.23E+02	4.02E+01	8.23E+01	4.34E+03	no								
Styrene	DMHL	24.1	87.6	8.72E+00	3.17E+01	6.95E+00	2.53E+01	4.51E+00	1.64E+01	3.02E+00	1.10E+01	2.10E+04	no								
Toluene	DMHL	472	1659	1.71E+02	6.01E+02	1.36E+02	4.79E+02	8.84E+01	3.11E+02	5.91E+01	2.08E+02	3.70E+04	no								
1,3-Butadiene	FILL	2.4	4.1	8.57E-01	1.48E+00	6.83E-01	1.18E+00	4.43E-01	7.68E-01	2.97E-01	5.14E-01	2.00E+01	no								
2-Butanone (MEK)	FILL	5.7	16.0	2.06E+00	5.79E+00	1.64E+00	4.62E+00	1.07E+00	3.00E+00	7.14E-01	2.01E+00	1.30E+04	no								
Acetone	FILL	5.8	28.5	2.08E+00	1.03E+01	1.66E+00	8.22E+00	1.08E+00	5.34E+00	7.21E-01	3.57E+00	6.18E+04	no								
Benzene	FILL	11.1	40.7	4.00E+00	1.47E+01	3.19E+00	1.17E+01	2.07E+00	7.63E+00	1.38E+00	5.10E+00	1.60E+02	no								
Carbon Disulfide	FILL	2.5	4.1	8.93E-01	1.48E+00	7.12E-01	1.18E+00	4.62E-01	7.68E-01	3.09E-01	5.14E-01	6.20E+03	no								
Dichloromethane (Methylene Chloride)	FILL	2.3	11.3	8.36E-01	4.09E+00	6.66E-01	3.26E+00	4.33E-01	2.12E+00	2.89E-01	1.42E+00	2.08E+03	no								
Ethylbenzene	FILL	119	250	4.29E+01	9.05E+01	3.42E+01	7.21E+01	2.22E+01	4.68E+01	1.49E+01	3.13E+01	4.34E+03	no								
m,p-Xylenes	FILL	25.2	59.5	9.13E+00	2.15E+01	7.28E+00	1.72E+01	4.73E+00	1.11E+01	3.16E+00	7.46E+00	4.34E+03	no								
o-Xylene	FILL	10.0	31.3	3.61E+00	1.13E+01	2.88E+00	9.03E+00	1.87E+00	5.86E+00	1.25E+00	3.92E+00	4.34E+03	no								
Styrene	FILL	1.0	1.6	3.57E-01	5.79E-01	2.84E-01	4.62E-01	1.85E-01	3.00E-01	1.23E-01	2.01E-01	2.10E+04	no								
Toluene	FILL	8.8	26.9	3.20E+00	9.74E+00	2.55E+00	7.76E+00	1.65E+00	5.04E+00	1.11E+00	3.37E+00	3.70E+04	no								
2-Butanone (MEK)	IS	1.4	2.6	5.04E-01	9.41E-01	4.02E-01	7.50E-01	2.61E-01	4.87E-01	1.75E-01	3.26E-01	1.30E+04	no								
Benzene	IS	0.56	0.97	2.04E-01	3.51E-01	1.63E-01	2.80E-01	1.06E-01	1.82E-01	7.06E-02	1.22E-01	1.60E+02	no								
Carbon Disulfide	IS	0.40	0.66	1.46E-01	2.39E-01	1.16E-01	1.90E-01	7.55E-02	1.24E-01	5.05E-02	8.27E-02	6.20E+03	no								
Ethylbenzene	IS	0.45	0.78	1.64E-01	2.82E-01	1.31E-01	2.25E-01	8.47E-02	1.46E-01	5.67E-02	9.78E-02	4.34E+03	no								
m,p-Xylenes	IS	0.8	1.3	3.00E-01	4.71E-01	2.39E-01	3.75E-01	1.55E-01	2.44E-01	1.04E-01	1.63E-01	4.34E+03	no								
o-Xylene	IS	0.50	0.88	1.81E-01	3.19E-01	1.44E-01	2.54E-01	9.35E-02	1.65E-01	6.26E-02	1.10E-01	4.34E+03	no								
Toluene	IS	0.53	0.94	1.92E-01	3.40E-01	1.53E-01	2.71E-01	9.94E-02	1.76E-01	6.65E-02	1.18E-01	3.70E+04	no								
Benzene	NATIVE**	2927	4695	1.06E+03	1.70E+03	8.44E+02	1.35E+03	5.48E+02	8.80E+02	3.67E+02	5.88E+02	1.60E+02	**yes**	**562%**	**962%**	**428%**	**747%**	**243%**	**450%**	**129%**	**268%**
Ethylbenzene	NATIVE**	39501	78250	1.43E+04	2.83E+04	1.14E+04	2.26E+04	7.40E+03	1.47E+04	4.95E+03	9.81E+03	4.34E+03	**yes**	**230%**	**553%**	**163%**	**420%**	71%	**238%**	14%	**126%**
m,p-Xylenes	NATIVE**	470	908	1.70E+02	3.29E+02	1.35E+02	2.62E+02	8.80E+01	1.70E+02	5.88E+01	1.14E+02	4.34E+03	no								
o-Xylene	NATIVE**	210	407	7.60E+01	1.47E+02	6.05E+01	1.17E+02	3.93E+01	7.63E+01	2.63E+01	5.10E+01	4.34E+03	no								
Toluene	NATIVE**	1789	3443	6.48E+02	1.25E+03	5.16E+02	9.94E+02	3.35E+02	6.45E+02	2.24E+02	4.32E+02	3.70E+04	no								
2-Butanone (MEK)	STYRENE	5.52	3.8	2.00E+00	1.38E+00	1.59E+00	1.10E+00	1.03E+00	7.12E-01	6.91E-01	4.76E-01	1.30E+04	no								
Acetone	STYRENE	129	501	4.65E+01	1.81E+02	3.71E+01	1.45E+02	2.41E+01	9.39E+01	1.61E+01	6.28E+01	6.18E+04	no								
Benzene	STYRENE	3774	10955	1.37E+03	3.97E+03	1.09E+03	3.16E+03	7.07E+02	2.05E+03	4.73E+02	1.37E+03	1.60E+02	**yes**	**754%**	**2379%**	**581%**	**1876%**	**342%**	**1183%**	**196%**	**758%**
Ethylbenzene	STYRENE	11284	28483	4.09E+03	1.03E+04	3.26E+03	8.22E+03	2.11E+03	5.34E+03	1.41E+03	3.57E+03	4.34E+03	**yes**		**138%**		89%		23%		
o-Xylene	STYRENE	3.48	3.4	1.26E+00	1.23E+00	1.00E+00	9.81E-01	6.52E-01	6.37E-01	4.36E-01	4.26E-01	4.34E+03	no								
Styrene	STYRENE	90	344	3.27E+01	1.25E+02	2.60E+01	9.93E+01	1.69E+01	6.45E+01	1.13E+01	4.31E+01	2.10E+04	no								
Toluene	STYRENE	1101	3099	3.98E+02	1.12E+03	3.18E+02	8.94E+02	2.06E+02	5.81E+02	1.38E+02	3.88E+02	3.70E+04	no								
Vinyl Acetate	STYRENE	21.44	7.8	7.76E+00	2.82E+00	6.19E+00	2.25E+00	4.02E+00	1.46E+00	2.69E+00	9.78E-01	3.50E+01	no								

**Note: Native Clay Sample results may be affected by overlying drilling muds with high volatile content (See PNL-7-21 DHF results).
Does not included detected Sulfur Compounds

Table F2-9

Calculated Annual Average (long term) Exposure Concentrations
Maximum and Average Chemical Specific Source Flux
Scenario 3 - 7,500 ft^2 Excavation Area

Chemicals	Source Values			Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Annual Average Concentrations (ug/m3) - Long Term Exposure								Chronic Threshold Values MRL or REL (ug/m3)	Potential Exceedances?	Estimated Percent Threshold Exceedance							
	Waste Type	Flux (ug/m2-min)		100 ft		300 ft		600 ft		1,000 ft				100 feet		300 feet		600 feet		1,000 feet	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max			avg	max	avg	max	avg	max	avg	max
2-Butanone (MEK)	DM	7.3	20	2.26E-01	6.20E-01	5.74E-02	1.57E-01	1.91E-02	5.22E-02	8.22E-03	2.25E-02	1.00E+03	no								
Acetone	DM	4.5	14.1	1.39E-01	4.37E-01	3.52E-02	1.11E-01	1.17E-02	3.68E-02	5.04E-03	1.59E-02	3.09E+04	no								
Benzene	DM	1514	6573	4.69E+01	2.04E+02	1.19E+01	5.16E+01	3.95E+00	1.72E+01	1.70E+00	7.40E+00	1.28E+01	**yes**	**267%**	**1491%**		**303%**		34%		
Carbon Disulfide	DM	2.56	1.5	7.94E-02	4.65E-02	2.01E-02	1.18E-02	6.69E-03	3.92E-03	2.88E-03	1.69E-03	8.00E+02	no								
Dichloromethane (Methylene Chloride)	DM	4.1	11.9	1.28E-01	3.69E-01	3.24E-02	9.35E-02	1.08E-02	3.11E-02	4.65E-03	1.34E-02	4.00E+02	no								
Ethylbenzene	DM	816	11000	2.53E+01	3.41E+02	6.41E+00	8.64E+01	2.13E+00	2.87E+01	9.18E-01	1.24E+01	2.00E+03	no								
m,p-Xylenes	DM	1972	7825	6.11E+01	2.42E+02	1.55E+01	6.15E+01	5.15E+00	2.04E+01	2.22E+00	8.80E+00	7.00E+02	no								
o-Xylene	DM	879	3756	2.72E+01	1.16E+02	6.91E+00	2.95E+01	2.30E+00	9.80E+00	9.89E-01	4.23E+00	7.00E+02	no								
Toluene	DM	1752	10329	5.43E+01	3.20E+02	1.38E+01	8.11E+01	4.57E+00	2.70E+01	1.97E+00	1.16E+01	3.00E+02	yes								
1,3-Butadiene	DMHL	12.4	43.8	3.84E-01	1.36E+00	9.73E-02	3.44E-01	3.23E-02	1.14E-01	1.39E-02	4.93E-02	2.00E+01	no								
2-Butanone (MEK)	DMHL	18.9	34.4	5.84E-01	1.07E+00	1.48E-01	2.70E-01	4.92E-02	8.98E-02	2.12E-02	3.87E-02	1.00E+03	no								
Benzene	DMHL	1403	2817	4.35E+01	8.73E+01	1.10E+01	2.21E+01	3.66E+00	7.35E+00	1.58E+00	3.17E+00	1.28E+01	**yes**	**240%**	**582%**		73%				
Carbon Disulfide	DMHL	5.7	11.3	1.76E-01	3.50E-01	4.45E-02	8.87E-02	1.48E-02	2.95E-02	6.37E-03	1.27E-02	8.00E+02	no								
Chlorobenzene	DMHL	11.9	28.8	3.69E-01	8.92E-01	9.37E-02	2.26E-01	3.11E-02	7.52E-02	1.34E-02	3.24E-02	1.00E+03	no								
Dichloromethane (Methylene Chloride)	DMHL	24.0	56.3	7.44E-01	1.74E+00	1.89E-01	4.42E-01	6.27E-02	1.47E-01	2.70E-02	6.33E-02	4.00E+02	no								
Ethylbenzene	DMHL	849	2567	2.63E+01	7.95E+01	6.67E+00	2.02E+01	2.22E+00	6.70E+00	9.55E-01	2.89E+00	2.00E+03	no								
m,p-Xylenes	DMHL	1119	3130	3.47E+01	9.70E+01	8.79E+00	2.46E+01	2.92E+00	8.17E+00	1.26E+00	3.52E+00	7.00E+02	no								
o-Xylene	DMHL	321	657	9.94E+00	2.04E+01	2.52E+00	5.16E+00	8.38E-01	1.71E+00	3.61E-01	7.39E-01	7.00E+02	no								
Styrene	DMHL	24.1	87.6	7.46E-01	2.71E+00	1.89E-01	6.88E-01	6.28E-02	2.29E-01	2.71E-02	9.86E-02	9.00E+02	no								
Toluene	DMHL	472	1659	1.46E+01	5.14E+01	3.70E+00	1.30E+01	1.23E+00	4.33E+00	5.31E-01	1.87E+00	3.00E+02	no								
1,3-Butadiene	FILL	2.4	4.1	7.33E-02	1.27E-01	1.86E-02	3.22E-02	6.18E-03	1.07E-02	2.66E-03	4.61E-03	2.00E+01	no								
2-Butanone (MEK)	FILL	5.7	16.0	1.76E-01	4.96E-01	4.47E-02	1.26E-01	1.49E-02	4.18E-02	6.41E-03	1.80E-02	1.00E+03	no								
Acetone	FILL	5.8	28.5	1.78E-01	8.83E-01	4.52E-02	2.24E-01	1.50E-02	7.44E-02	6.48E-03	3.21E-02	3.09E+04	no								
Benzene	FILL	11.1	40.7	3.42E-01	1.26E+00	8.68E-02	3.20E-01	2.88E-02	1.06E-01	1.24E-02	4.58E-02	1.28E+01	no								
Carbon Disulfide	FILL	2.5	4.1	7.64E-02	1.27E-01	1.94E-02	3.22E-02	6.44E-03	1.07E-02	2.78E-03	4.61E-03	8.00E+02	no								
Dichloromethane (Methylene Chloride)	FILL	2.3	11.3	7.16E-02	3.50E-01	1.81E-02	8.87E-02	6.03E-03	2.95E-02	2.60E-03	1.27E-02	4.00E+02	no								
Ethylbenzene	FILL	119	250	3.67E+00	7.75E+00	9.31E-01	1.96E+00	3.09E-01	6.53E-01	1.33E-01	2.81E-01	2.00E+03	no								
m,p-Xylenes	FILL	25.2	59.5	7.82E-01	1.84E+00	1.98E-01	4.67E-01	6.58E-02	1.55E-01	2.84E-02	6.69E-02	7.00E+02	no								
o-Xylene	FILL	10.0	31.3	3.09E-01	9.70E-01	7.84E-02	2.46E-01	2.60E-02	8.17E-02	1.12E-02	3.52E-02	7.00E+02	no								
Styrene	FILL	1.0	1.6	3.05E-02	4.96E-02	7.73E-03	1.26E-02	2.57E-03	4.18E-03	1.11E-03	1.80E-03	9.00E+02	no								
Toluene	FILL	8.8	26.9	2.73E-01	8.33E-01	6.93E-02	2.11E-01	2.30E-02	7.02E-02	9.93E-03	3.03E-02	3.00E+02	no								
2-Butanone (MEK)	IS	1.4	2.6	4.32E-02	8.06E-02	1.09E-02	2.04E-02	3.64E-03	6.79E-03	1.57E-03	2.93E-03	1.00E+03	no								
Benzene	IS	0.56	0.97	1.75E-02	3.01E-02	4.42E-03	7.62E-03	1.47E-03	2.53E-03	6.34E-04	1.09E-03	1.28E+01	no								
Carbon Disulfide	IS	0.40	0.66	1.25E-02	2.04E-02	3.16E-03	5.18E-03	1.05E-03	1.72E-03	4.53E-04	7.43E-04	8.00E+02	no								
Ethylbenzene	IS	0.45	0.78	1.40E-02	2.42E-02	3.55E-03	6.13E-03	1.18E-03	2.04E-03	5.09E-04	8.78E-04	2.00E+03	no								
m,p-Xylenes	IS	0.8	1.3	2.57E-02	4.03E-02	6.51E-03	1.02E-02	2.16E-03	3.39E-03	9.33E-04	1.46E-03	7.00E+02	no								
o-Xylene	IS	0.50	0.88	1.55E-02	2.73E-02	3.92E-03	6.91E-03	1.30E-03	2.30E-03	5.62E-04	9.90E-04	7.00E+02	no								
Toluene	IS	0.53	0.94	1.64E-02	2.91E-02	4.17E-03	7.38E-03	1.38E-03	2.45E-03	5.97E-04	1.06E-03	3.00E+02	no								
Benzene	NATIVE**	2927	4695	9.07E+01	1.45E+02	2.30E+01	3.69E+01	7.64E+00	1.23E+01	3.29E+00	5.28E+00	1.28E+01	**yes**	**608%**	**1036%**	80%	**188%**				
Ethylbenzene	NATIVE**	39501	78250	1.22E+03	2.42E+03	3.10E+02	6.15E+02	1.03E+02	2.04E+02	4.44E+01	8.80E+01	2.00E+03	**yes**		21%						
m,p-Xylenes	NATIVE**	470	908	1.45E+01	2.81E+01	3.69E+00	7.13E+00	1.23E+00	2.37E+00	5.28E-01	1.02E+00	7.00E+02	no								
o-Xylene	NATIVE**	210	407	6.50E+00	1.26E+01	1.65E+00	3.20E+00	5.48E-01	1.06E+00	2.36E-01	4.58E-01	7.00E+02	no								
Toluene	NATIVE**	1789	3443	5.54E+01	1.07E+02	1.40E+01	2.70E+01	4.67E+00	8.99E+00	2.01E+00	3.87E+00	3.00E+02	no								
2-Butanone (MEK)	STYRENE	5.52	3.8	1.71E-01	1.18E-01	4.33E-02	2.98E-02	1.44E-02	9.92E-03	6.21E-03	4.28E-03	1.00E+03	no								
Acetone	STYRENE	129	501	3.98E+00	1.55E+01	1.01E+00	3.93E+00	3.35E-01	1.31E+00	1.45E-01	5.64E-01	3.09E+04	no								
Benzene	STYRENE	3774	10955	1.17E+02	3.39E+02	2.96E+01	8.60E+01	9.85E+00	2.86E+01	4.25E+00	1.23E+01	1.28E+01	**yes**	**813%**	**2552%**	**132%**	**572%**		**123%**		
Ethylbenzene	STYRENE	11284	28483	3.50E+02	8.83E+02	8.86E+01	2.24E+02	2.95E+01	7.43E+01	1.27E+01	3.20E+01	2.00E+03	no								
o-Xylene	STYRENE	3.48	3.4	1.08E-01	1.05E-01	2.73E-02	2.67E-02	9.09E-03	8.87E-03	3.92E-03	3.83E-03	7.00E+02	no								
Styrene	STYRENE	90	344	2.80E+00	1.07E+01	7.09E-01	2.70E+00	2.36E-01	8.98E-01	1.02E-01	3.87E-01	9.00E+02	no								
Toluene	STYRENE	1101	3099	3.41E+01	9.60E+01	8.64E+00	2.43E+01	2.87E+00	8.09E+00	1.24E+00	3.49E+00	3.00E+02	no								
Vinyl Acetate	STYRENE	21.44	7.8	6.64E-01	2.42E-01	1.68E-01	6.13E-02	5.60E-02	2.04E-02	2.41E-02	8.78E-03	3.50E+01	no								

**Note: Native Clay Sample results may be affected by overlying drilling muds with high volatile content (See PNL-7-21 DHF results).
Does not included detected Sulfur Compounds

Table F2-10
Calculated Hourly Average (short term) Exposure Concentrations
Maximum and Average Chemical Specific Source Flux
Scenario 3 - 7,500 ft^2 Excavation Area

Chemicals	Source Values			Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Hourly Average Concentrations (ug/m3) - Short Term Exposure								Chronic Threshold Values MRL or REL (ug/m3)	Potential Exceedances?	Estimated Percent Threshold Exceedance							
	Waste Type	Flux (ug/m2-min)		100 ft		300 ft		600 ft		1,000 ft				100 feet		300 feet		600 feet		1,000 feet	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max			avg	max	avg	max	avg	max	avg	max
2-Butanone (MEK)	DM	7.3	20	3.25E+00	8.89E+00	2.82E+00	7.71E+00	1.97E+00	5.39E+00	1.34E+00	3.68E+00	1.30E+04	no								
Acetone	DM	4.5	14.1	1.99E+00	6.27E+00	1.73E+00	5.43E+00	1.21E+00	3.80E+00	8.24E-01	2.59E+00	6.18E+04	no								
Benzene	DM	1514	6573	6.73E+02	2.92E+03	5.84E+02	2.53E+03	4.08E+02	1.77E+03	2.78E+02	1.21E+03	1.60E+02	**yes**	**321%**	**1726%**	**265%**	**1483%**	**155%**	**1006%**	74%	**655%**
Carbon Disulfide	DM	2.56	1.5	1.14E+00	6.67E-01	9.88E-01	5.78E-01	6.91E-01	4.04E-01	4.71E-01	2.76E-01	6.20E+03	no								
Dichloromethane (Methylene Chloride)	DM	4.1	11.9	1.84E+00	5.29E+00	1.59E+00	4.59E+00	1.11E+00	3.21E+00	7.59E-01	2.19E+00	2.08E+03	no								
Ethylbenzene	DM	816	11000	3.63E+02	4.89E+03	3.14E+02	4.24E+03	2.20E+02	2.96E+03	1.50E+02	2.02E+03	4.34E+03	**yes**		13%						
m,p-Xylenes	DM	1972	7825	8.77E+02	3.48E+03	7.60E+02	3.02E+03	5.31E+02	2.11E+03	3.62E+02	1.44E+03	4.34E+03	no								
o-Xylene	DM	879	3756	3.91E+02	1.67E+03	3.39E+02	1.45E+03	2.37E+02	1.01E+03	1.62E+02	6.90E+02	4.34E+03	no								
Toluene	DM	1752	10329	7.79E+02	4.59E+03	6.75E+02	3.98E+03	4.72E+02	2.78E+03	3.22E+02	1.90E+03	3.70E+04	no								
1,3-Butadiene	DMHL	12.4	43.8	5.51E+00	1.95E+01	4.78E+00	1.69E+01	3.34E+00	1.18E+01	2.28E+00	8.05E+00	2.00E+01	no								
2-Butanone (MEK)	DMHL	18.9	34.4	8.38E+00	1.53E+01	7.27E+00	1.33E+01	5.08E+00	9.27E+00	3.47E+00	6.32E+00	1.30E+04	no								
Benzene	DMHL	1403	2817	6.24E+02	1.25E+03	5.41E+02	1.09E+03	3.78E+02	7.59E+02	2.58E+02	5.18E+02	1.60E+02	**yes**	**290%**	**683%**	**238%**	**578%**	**136%**	**374%**	61%	**224%**
Carbon Disulfide	DMHL	5.7	11.3	2.52E+00	5.02E+00	2.18E+00	4.35E+00	1.53E+00	3.04E+00	1.04E+00	2.08E+00	6.20E+03	no								
Chlorobenzene	DMHL	11.9	28.8	5.30E+00	1.28E+01	4.60E+00	1.11E+01	3.21E+00	7.76E+00	2.19E+00	5.29E+00	1.00E+03	no								
Dichloromethane (Methylene Chloride)	DMHL	24.0	56.3	1.07E+01	2.50E+01	9.26E+00	2.17E+01	6.47E+00	1.52E+01	4.41E+00	1.03E+01	2.08E+03	no								
Ethylbenzene	DMHL	849	2567	3.77E+02	1.14E+03	3.27E+02	9.89E+02	2.29E+02	6.91E+02	1.56E+02	4.72E+02	4.34E+03	no								
m,p-Xylenes	DMHL	1119	3130	4.98E+02	1.39E+03	4.31E+02	1.21E+03	3.01E+02	8.43E+02	2.06E+02	5.75E+02	4.34E+03	no								
o-Xylene	DMHL	321	657	1.43E+02	2.92E+02	1.24E+02	2.53E+02	8.64E+01	1.77E+02	5.90E+01	1.21E+02	4.34E+03	no								
Styrene	DMHL	24.1	87.6	1.07E+01	3.89E+01	9.27E+00	3.38E+01	6.48E+00	2.36E+01	4.42E+00	1.61E+01	2.10E+04	no								
Toluene	DMHL	472	1659	2.10E+02	7.37E+02	1.82E+02	6.39E+02	1.27E+02	4.47E+02	8.67E+01	3.05E+02	3.70E+04	no								
1,3-Butadiene	FILL	2.4	4.1	1.05E+00	1.82E+00	9.12E-01	1.58E+00	6.37E-01	1.10E+00	4.35E-01	7.53E-01	2.00E+01	no								
2-Butanone (MEK)	FILL	5.7	16.0	2.53E+00	7.11E+00	2.19E+00	6.17E+00	1.53E+00	4.31E+00	1.05E+00	2.94E+00	1.30E+04	no								
Acetone	FILL	5.8	28.5	2.56E+00	1.27E+01	2.22E+00	1.10E+01	1.55E+00	7.68E+00	1.06E+00	5.24E+00	6.18E+04	no								
Benzene	FILL	11.1	40.7	4.91E+00	1.81E+01	4.26E+00	1.57E+01	2.98E+00	1.10E+01	2.03E+00	7.48E+00	1.60E+02	no								
Carbon Disulfide	FILL	2.5	4.1	1.10E+00	1.82E+00	9.50E-01	1.58E+00	6.64E-01	1.10E+00	4.53E-01	7.53E-01	6.20E+03	no								
Dichloromethane (Methylene Chloride)	FILL	2.3	11.3	1.03E+00	5.02E+00	8.90E-01	4.35E+00	6.22E-01	3.04E+00	4.24E-01	2.08E+00	2.08E+03	no								
Ethylbenzene	FILL	119	250	5.27E+01	1.11E+02	4.57E+01	9.63E+01	3.19E+01	6.73E+01	2.18E+01	4.59E+01	4.34E+03	no								
m,p-Xylenes	FILL	25.2	59.5	1.12E+01	2.64E+01	9.72E+00	2.29E+01	6.79E+00	1.60E+01	4.64E+00	1.09E+01	4.34E+03	no								
o-Xylene	FILL	10.0	31.3	4.44E+00	1.39E+01	3.84E+00	1.21E+01	2.69E+00	8.43E+00	1.83E+00	5.75E+00	4.34E+03	no								
Styrene	FILL	1.0	1.6	4.38E-01	7.11E-01	3.79E-01	6.17E-01	2.65E-01	4.31E-01	1.81E-01	2.94E-01	2.10E+04	no								
Toluene	FILL	8.8	26.9	3.92E+00	1.20E+01	3.40E+00	1.04E+01	2.38E+00	7.25E+00	1.62E+00	4.94E+00	3.70E+04	no								
2-Butanone (MEK)	IS	1.4	2.6	6.19E-01	1.16E+00	5.37E-01	1.00E+00	3.75E-01	7.00E-01	2.56E-01	4.78E-01	1.30E+04	no								
Benzene	IS	0.56	0.97	2.50E-01	4.31E-01	2.17E-01	3.74E-01	1.52E-01	2.61E-01	1.04E-01	1.78E-01	1.60E+02	no								
Carbon Disulfide	IS	0.40	0.66	1.79E-01	2.93E-01	1.55E-01	2.54E-01	1.09E-01	1.78E-01	7.41E-02	1.21E-01	6.20E+03	no								
Ethylbenzene	IS	0.45	0.78	2.01E-01	3.47E-01	1.74E-01	3.01E-01	1.22E-01	2.10E-01	8.31E-02	1.43E-01	4.34E+03	no								
m,p-Xylenes	IS	0.8	1.3	3.69E-01	5.78E-01	3.20E-01	5.01E-01	2.23E-01	3.50E-01	1.52E-01	2.39E-01	4.34E+03	no								
o-Xylene	IS	0.50	0.88	2.22E-01	3.91E-01	1.92E-01	3.39E-01	1.34E-01	2.37E-01	9.17E-02	1.62E-01	4.34E+03	no								
Toluene	IS	0.53	0.94	2.36E-01	4.18E-01	2.04E-01	3.62E-01	1.43E-01	2.53E-01	9.75E-02	1.73E-01	3.70E+04	no								
Benzene	NATIVE**	2927	4695	1.30E+03	2.09E+03	1.13E+03	1.81E+03	7.88E+02	1.26E+03	5.38E+02	8.63E+02	1.60E+02	**yes**	**713%**	**1204%**	**605%**	**1031%**	**393%**	**690%**	**236%**	**439%**
Ethylbenzene	NATIVE**	39501	78250	1.76E+04	3.48E+04	1.52E+04	3.02E+04	1.06E+04	2.11E+04	7.26E+03	1.44E+04	4.34E+03	**yes**	**305%**	**701%**	**251%**	**595%**	**145%**	**386%**	67%	**231%**
m,p-Xylenes	NATIVE**	470	908	2.09E+02	4.04E+02	1.81E+02	3.50E+02	1.26E+02	2.45E+02	8.63E+01	1.67E+02	4.34E+03	no								
o-Xylene	NATIVE**	210	407	9.33E+01	1.81E+02	8.08E+01	1.57E+02	5.65E+01	1.10E+02	3.86E+01	7.48E+01	4.34E+03	no								
Toluene	NATIVE**	1789	3443	7.95E+02	1.53E+03	6.89E+02	1.33E+03	4.82E+02	9.27E+02	3.29E+02	6.33E+02	3.70E+04	no								
2-Butanone (MEK)	STYRENE	5.52	3.8	2.45E+00	1.69E+00	2.13E+00	1.46E+00	1.49E+00	1.02E+00	1.01E+00	6.98E-01	1.30E+04	no								
Acetone	STYRENE	129	501	5.71E+01	2.23E+02	4.95E+01	1.93E+02	3.46E+01	1.35E+02	2.36E+01	9.21E+01	6.18E+04	no								
Benzene	STYRENE	3774	10955	1.68E+03	4.87E+03	1.45E+03	4.22E+03	1.02E+03	2.95E+03	6.94E+02	2.01E+03	1.60E+02	**yes**	**948%**	**2944%**	**809%**	**2538%**	**535%**	**1744%**	**333%**	**1158%**
Ethylbenzene	STYRENE	11284	28483	5.02E+03	1.27E+04	4.35E+03	1.10E+04	3.04E+03	7.67E+03	2.07E+03	5.23E+03	4.34E+03	**yes**	16%	**192%**		**153%**		77%		21%
o-Xylene	STYRENE	3.48	3.4	1.55E+00	1.51E+00	1.34E+00	1.31E+00	9.38E-01	9.16E-01	6.40E-01	6.25E-01	4.34E+03	no								
Styrene	STYRENE	90	344	4.01E+01	1.53E+02	3.48E+01	1.33E+02	2.43E+01	9.27E+01	1.66E+01	6.32E+01	2.10E+04	no								
Toluene	STYRENE	1101	3099	4.89E+02	1.38E+03	4.24E+02	1.19E+03	2.96E+02	8.35E+02	2.02E+02	5.70E+02	3.70E+04	no								
Vinyl Acetate	STYRENE	21.44	7.8	9.53E+00	3.47E+00	8.26E+00	3.01E+00	5.77E+00	2.10E+00	3.94E+00	1.43E+00	3.50E+01	no								

**Note: Native Clay Sample results may be affected by overlying drilling muds with high volatile content (See PNL-7-21 DHF results).
Does not included detected Sulfur Compounds

Table F2-11
Calculated Annual & Hourly Average Odor Concentrations
Maximum and Average Source Odor Flux
Scenario 1 - 2,500 ft^2 Excavation Area

Waste Stream	Source Values		Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Annual Average Concentrations (D/T) - Long Term Exposure								Threshold Eval Calculated
	Flux ((D/T)/m2-min)		100 ft		300 ft		600 ft		1,000 ft		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	D/T > 7 ?
Drill Mud	1,210	2,602	1.89E+01	4.07E+01	3.69E+00	7.93E+00	1.14E+00	2.45E+00	4.73E-01	1.02E+00	**yes**
Drill Mud - High Liquid	3,137	7,903	4.90E+01	1.24E+02	9.57E+00	2.41E+01	2.95E+00	7.43E+00	1.23E+00	3.09E+00	**yes**
Fill	385	385	6.02E+00	6.02E+00	1.17E+00	1.17E+00	3.62E-01	3.62E-01	1.50E-01	1.50E-01	no
Impacted Soil	15	18	2.34E-01	2.81E-01	4.57E-02	5.49E-02	1.41E-02	1.69E-02	5.86E-03	7.04E-03	no
Native	744	1,549	1.16E+01	2.42E+01	2.27E+00	4.72E+00	7.00E-01	1.46E+00	2.91E-01	6.05E-01	**yes**
Styrene Impacted	460	667	7.19E+00	1.04E+01	1.40E+00	2.03E+00	4.33E-01	6.27E-01	1.80E-01	2.61E-01	**yes**
Oil	31	89	4.80E-01	1.39E+00	9.36E-02	2.71E-01	2.89E-02	8.37E-02	1.20E-02	3.48E-02	no

Estimated Percent Threshold Exceedance								
100 feet		300 feet		600 feet		1,000 feet	
avg	max	avg	max	avg	max	avg	max
170%	**481%**		13%				
600%	**1664%**	37%	**244%**		6%		
66%	**246%**						
3%	49%						

Waste Stream	Source Values		Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Hourly Average Concentrations (D/T) - Short Term Exposure								Threshold Eval Calculated
	Flux ((D/T)/m2-min)		100 ft		300 ft		600 ft		1,000 ft		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	D/T > 7 ?
Drill Mud	1,210	2,602	3.02E+02	6.50E+02	2.00E+02	4.31E+02	1.19E+02	2.57E+02	7.81E+01	1.68E+02	**yes**
Drill Mud - High Liquid	3,137	7,903	7.84E+02	1.97E+03	5.20E+02	1.31E+03	3.09E+02	7.79E+02	2.02E+02	5.10E+02	**yes**
Fill	385	385	9.62E+01	9.62E+01	6.38E+01	6.38E+01	3.80E+01	3.80E+01	2.49E+01	2.49E+01	**yes**
Impacted Soil	15	18	3.75E+00	4.50E+00	2.48E+00	2.98E+00	1.48E+00	1.77E+00	9.68E-01	1.16E+00	no
Native	744	1,549	1.86E+02	3.87E+02	1.23E+02	2.57E+02	7.34E+01	1.53E+02	4.80E+01	1.00E+02	**yes**
Styrene Impacted	460	667	1.15E+02	1.67E+02	7.62E+01	1.10E+02	4.54E+01	6.58E+01	2.97E+01	4.31E+01	**yes**
Oil	31	89	7.67E+00	2.22E+01	5.09E+00	1.47E+01	3.03E+00	8.78E+00	1.98E+00	5.75E+00	**yes**

Estimated Percent Threshold Exceedance							
100 feet		300 feet		600 feet		1,000 feet	
avg	max	avg	max	avg	max	avg	max
4219%	**9188%**	**2763%**	**6058%**	**1604%**	**3565%**	**1016%**	**2299%**
11097%	**28109%**	**7324%**	**18602%**	**4319%**	**11031%**	**2793%**	**7188%**
1274%	**1274%**	**811%**	**811%**	**442%**	**442%**	**255%**	**255%**
2556%	**5429%**	**1661%**	**3566%**	**948%**	**2082%**	**586%**	**1328%**
1542%	**2281%**	**989%**	**1478%**	**548%**	**839%**	**324%**	**515%**
10%	**218%**		**111%**		25%		

Table F2-12
Calculated Annual & Hourly Average Odor Concentrations
Maximum and Average Source Odor Flux
Scenario 2 - 5,000 ft^2 Excavation Area

Waste Stream	Source Values		Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Annual Average Concentrations (D/T) - Long Term Exposure								Threshold Eval Calculated
	Flux ((D/T)/m2-min)		100 ft		300 ft		600 ft		1,000 ft		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	D/T > 7 ?
Drill Mud	1,210	2,602	2.87E+01	6.18E+01	6.84E+00	1.47E+01	2.18E+00	4.69E+00	9.18E-01	1.97E+00	**yes**
Drill Mud - High Liquid	3,137	7,903	7.45E+01	1.88E+02	1.77E+01	4.47E+01	5.66E+00	1.43E+01	2.38E+00	5.99E+00	**yes**
Fill	385	385	9.14E+00	9.14E+00	2.18E+00	2.18E+00	6.94E-01	6.94E-01	2.92E-01	2.92E-01	**yes**
Impacted Soil	15	18	3.56E-01	4.27E-01	8.48E-02	1.02E-01	2.71E-02	3.25E-02	1.14E-02	1.37E-02	no
Native	744	1,549	1.77E+01	3.68E+01	4.20E+00	8.75E+00	1.34E+00	2.79E+00	5.64E-01	1.17E+00	**yes**
Styrene Impacted	460	667	1.09E+01	1.58E+01	2.60E+00	3.77E+00	8.30E-01	1.20E+00	3.49E-01	5.06E-01	**yes**
Oil	31	89	7.29E-01	2.11E+00	1.73E-01	5.03E-01	5.54E-02	1.61E-01	2.33E-02	6.75E-02	no

Estimated Percent Threshold Exceedance							
100 feet		300 feet		600 feet		1,000 feet	
avg	max	avg	max	avg	max	avg	max
310%	**783%**		**110%**				
964%	**2581%**	**153%**	**538%**		**104%**		
31%	31%						
152%	**425%**		25%				
56%	**126%**						

Waste Stream	Source Values		Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Hourly Average Concentrations (D/T) - Short Term Exposure								Threshold Eval Calculated
	Flux ((D/T)/m2-min)		100 ft		300 ft		600 ft		1,000 ft		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	D/T > 7 ?
Drill Mud	1,210	2,602	4.38E+02	9.42E+02	3.49E+02	7.51E+02	2.27E+02	4.88E+02	1.52E+02	3.26E+02	**yes**
Drill Mud - High Liquid	3,137	7,903	1.14E+03	2.86E+03	9.05E+02	2.28E+03	5.88E+02	1.48E+03	3.93E+02	9.91E+02	**yes**
Fill	385	385	1.39E+02	1.39E+02	1.11E+02	1.11E+02	7.21E+01	7.21E+01	4.83E+01	4.83E+01	**yes**
Impacted Soil	15	18	5.43E+00	6.52E+00	4.33E+00	5.19E+00	2.81E+00	3.37E+00	1.88E+00	2.26E+00	no
Native	744	1,549	2.69E+02	5.61E+02	2.15E+02	4.47E+02	1.39E+02	2.90E+02	9.32E+01	1.94E+02	**yes**
Styrene Impacted	460	667	1.67E+02	2.42E+02	1.33E+02	1.92E+02	8.62E+01	1.25E+02	5.77E+01	8.36E+01	**yes**
Oil	31	89	1.11E+01	3.22E+01	8.86E+00	2.57E+01	5.75E+00	1.67E+01	3.85E+00	1.12E+01	**yes**

Estimated Percent Threshold Exceedance							
100 feet		300 feet		600 feet		1,000 feet	
avg	max	avg	max	avg	max	avg	max
6159%	**13359%**	**4888%**	**10626%**	**3139%**	**6865%**	**2066%**	**4559%**
16127%	**40779%**	**12832%**	**32479%**	**8297%**	**21054%**	**5517%**	**14050%**
1891%	**1891%**	**1487%**	**1487%**	**931%**	**931%**	**589%**	**589%**
3748%	**7912%**	**2967%**	**6285%**	**1891%**	**4046%**	**1232%**	**2673%**
2279%	**3350%**	**1796%**	**2650%**	**1131%**	**1685%**	**724%**	**1094%**
59%	**360%**	27%	**267%**		**138%**		59%

Table F2-13
Calculated Annual & Hourly Average Odor Concentrations
Maximum and Average Source Odor Flux
Scenario 3 - 7,500 ft^2 Excavation Area

Waste Stream	Source Values		Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Annual Average Concentrations (D/T) - Long Term Exposure								Threshold Eval Calculated
	Flux ((D/T)/m2-min)		100 ft		300 ft		600 ft		1,000 ft		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	D/T > 7 ?
Drill Mud	1,210	2,602	3.75E+01	8.06E+01	9.50E+00	2.04E+01	3.16E+00	6.79E+00	1.36E+00	2.93E+00	**yes**
Drill Mud - High Liquid	3,137	7,903	9.72E+01	2.45E+02	2.46E+01	6.21E+01	8.19E+00	2.06E+01	3.53E+00	8.89E+00	**yes**
Fill	385	385	1.19E+01	1.19E+01	3.02E+00	3.02E+00	1.00E+00	1.00E+00	4.33E-01	4.33E-01	**yes**
Impacted Soil	15	18	4.65E-01	5.58E-01	1.18E-01	1.41E-01	3.92E-02	4.70E-02	1.69E-02	2.03E-02	no
Native	744	1,549	2.31E+01	4.80E+01	5.84E+00	1.22E+01	1.94E+00	4.04E+00	8.37E-01	1.74E+00	**yes**
Styrene Impacted	460	667	1.43E+01	2.07E+01	3.61E+00	5.24E+00	1.20E+00	1.74E+00	5.18E-01	7.51E-01	**yes**
Oil	31	89	9.51E-01	2.76E+00	2.41E-01	6.99E-01	8.01E-02	2.32E-01	3.45E-02	1.00E-01	no

Estimated Percent Threshold Exceedance								
100 feet		300 feet		600 feet		1,000 feet	
avg	max	avg	max	avg	max	avg	max
436%	**1052%**	36%	**192%**				
1289%	**3398%**	**252%**	**787%**	17%	**195%**		27%
70%	70%						
229%	**586%**		74%				
104%	**195%**						

Waste Stream	Source Values		Predicted Concentrations @ Receptor Distance for Avg & Max Source Flux Rates Hourly Average Concentrations (D/T) - Short Term Exposure								Threshold Eval Calculated
	Flux ((D/T)/m2-min)		100 ft		300 ft		600 ft		1,000 ft		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	D/T > 7 ?
Drill Mud	1,210	2,602	5.38E+02	1.16E+03	4.66E+02	1.00E+03	3.26E+02	7.01E+02	2.22E+02	4.78E+02	**yes**
Drill Mud - High Liquid	3,137	7,903	1.39E+03	3.51E+03	1.21E+03	3.05E+03	8.45E+02	2.13E+03	5.77E+02	1.45E+03	**yes**
Fill	385	385	1.71E+02	1.71E+02	1.48E+02	1.48E+02	1.04E+02	1.04E+02	7.08E+01	7.08E+01	**yes**
Impacted Soil	15	18	6.67E+00	8.00E+00	5.78E+00	6.94E+00	4.04E+00	4.85E+00	2.76E+00	3.31E+00	**yes**
Native	744	1,549	3.31E+02	6.89E+02	2.87E+02	5.97E+02	2.00E+02	4.17E+02	1.37E+02	2.85E+02	**yes**
Styrene Impacted	460	667	2.04E+02	2.97E+02	1.77E+02	2.57E+02	1.24E+02	1.80E+02	8.45E+01	1.23E+02	**yes**
Oil	31	89	1.36E+01	3.96E+01	1.18E+01	3.43E+01	8.27E+00	2.40E+01	5.64E+00	1.64E+01	**yes**

Estimated Percent Threshold Exceedance							
100 feet		300 feet		600 feet		1,000 feet	
avg	max	avg	max	avg	max	avg	max
7584%	**16424%**	**6560%**	**14223%**	**4556%**	**9912%**	**3077%**	**6731%**
19822%	**50088%**	**17168%**	**43402%**	**11970%**	**30309%**	**8136%**	**20649%**
2345%	**2345%**	**2019%**	**2019%**	**1381%**	**1381%**	**911%**	**911%**
	14%						
4625%	**9737%**	**3995%**	**8427%**	**2763%**	**5860%**	**1853%**	**3967%**
2821%	**4136%**	**2432%**	**3572%**	**1670%**	**2466%**	**1108%**	**1651%**
95%	**465%**	69%	**390%**	18%	**242%**		**134%**