BIOSCREEN Base Case

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Acenaphthene
Run Name

Data Input Instructions:

115 or 0.02 — *1. Enter value directly....or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*

20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		or	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		or	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

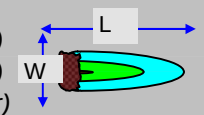
Retardation Factor*	*R*	113.4	*(-)*
or		or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	4898	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	2.2E+0	*(per yr)*
or		or	
Solute Half-Life	*t-half*	0.32	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

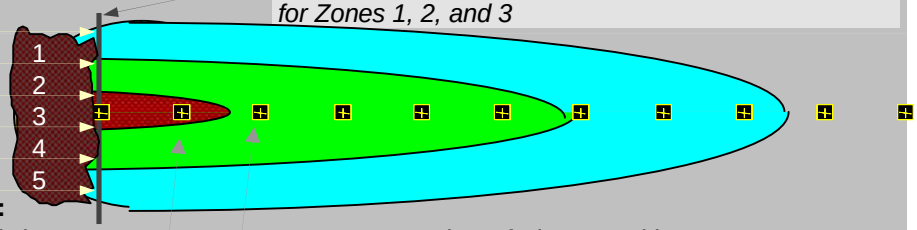
Width* (ft)	Conc. (mg/L)*
20	
30	
20	0.701
30	0
20	0

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

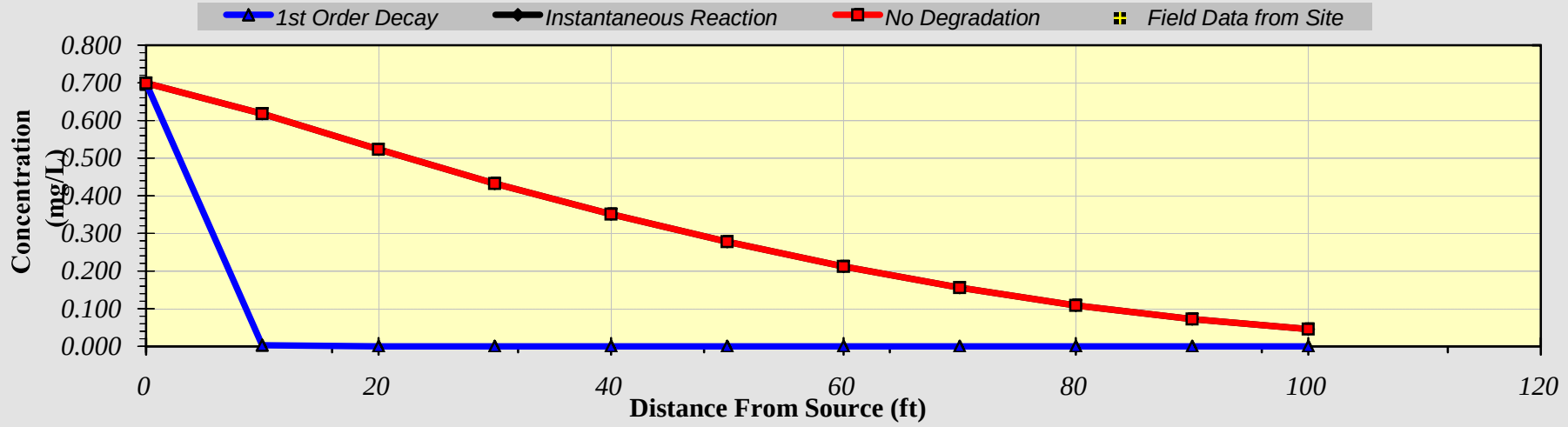
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

	Distance from Source (ft)										
TYPE OF MODEL	0	10	20	30	40	50	60	70	80	90	100
No Degradation	0.699	0.618	0.523	0.433	0.351	0.278	0.212	0.156	0.109	0.072	0.046
1st Order Decay	0.699	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.699	0.618	0.523	0.433	0.351	0.278	0.212	0.156	0.109	0.072	0.046
Field Data from Site											



Calculate Animation

Time: *100 Years*

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Naphthalene
Run Name

Data Input Instructions:

115 or 0.02 — *1. Enter value directly....or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*

20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		or	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		or	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

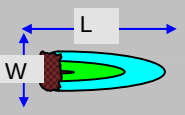
Retardation Factor*	*R*	28.3	*(-)*
or		or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	1191	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	1.6E+0	*(per yr)*
or		or	
Solute Half-Life	*t-half*	0.44	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

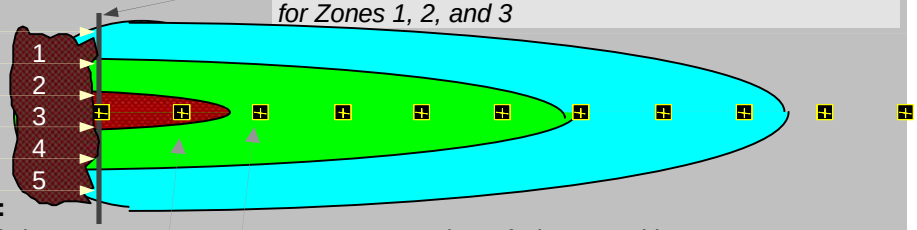
Width* (ft)	Conc. (mg/L)*
20	
30	
20	0.0619
30	0
20	0

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	0	10	20	30	40	50	60	70	80	90	100
Concentration (mg/L)											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

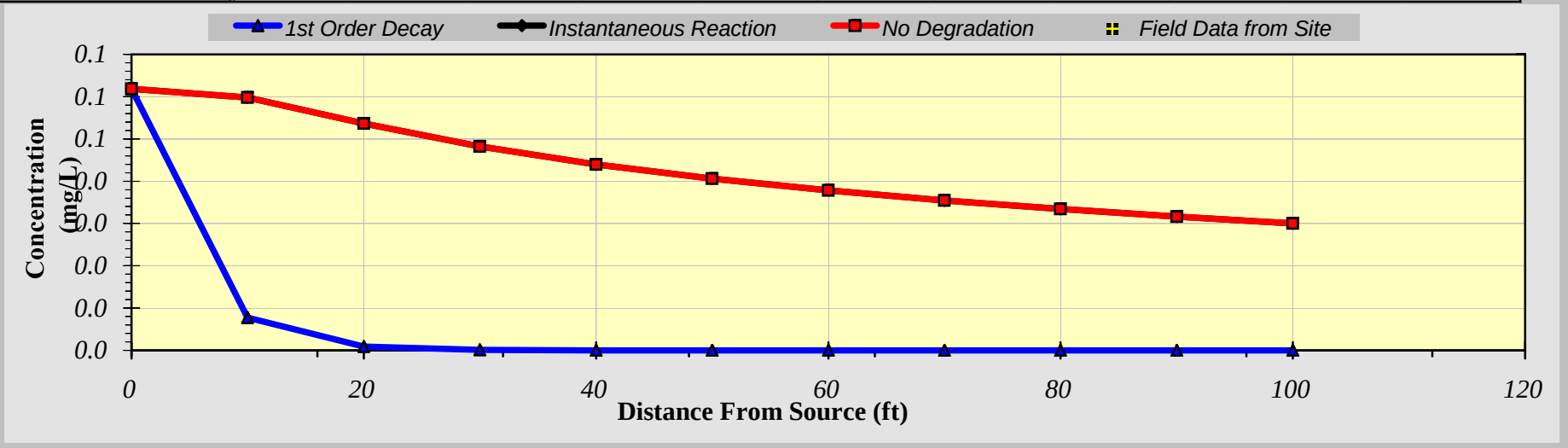
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	10	20	30	40	50	60	70	80	90	100
No Degradation	0.062	0.060	0.054	0.048	0.044	0.041	0.038	0.035	0.033	0.032	0.030
1st Order Decay	0.062	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.062	0.060	0.054	0.048	0.044	0.041	0.038	0.035	0.033	0.032	0.030
Field Data from Site											



Replay Animation

Next Timestep

Prev Timestep

Time:

100 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Sensitivity Run
High Degradation Half-life
(slower degradation rate)

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Acenaphthene
Run Name

Data Input Instructions:

115 or 0.02 — *1. Enter value directly....or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*

20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		or	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		or	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

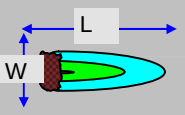
Retardation Factor*	*R*	113.4	*(-)*
or		or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	4898	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	2.2E-1	*(per yr)*
or		or	
Solute Half-Life	*t-half*	3.18	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

Width* (ft)	Conc. (mg/L)*
20	
30	
20	0.701
30	0
20	0

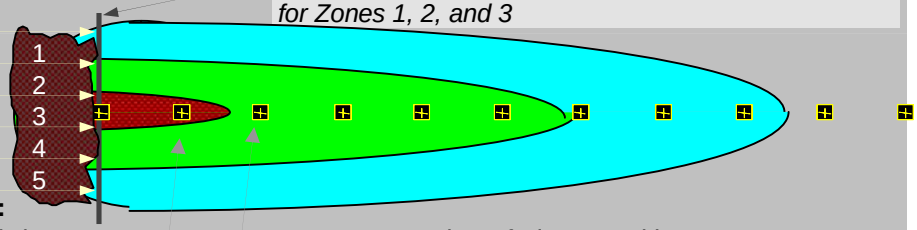
Source Halflife (see Help): >1000 | >1000 *(yr)*

Inst. React. or 1st Order

Soluble Mass 2000 *(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

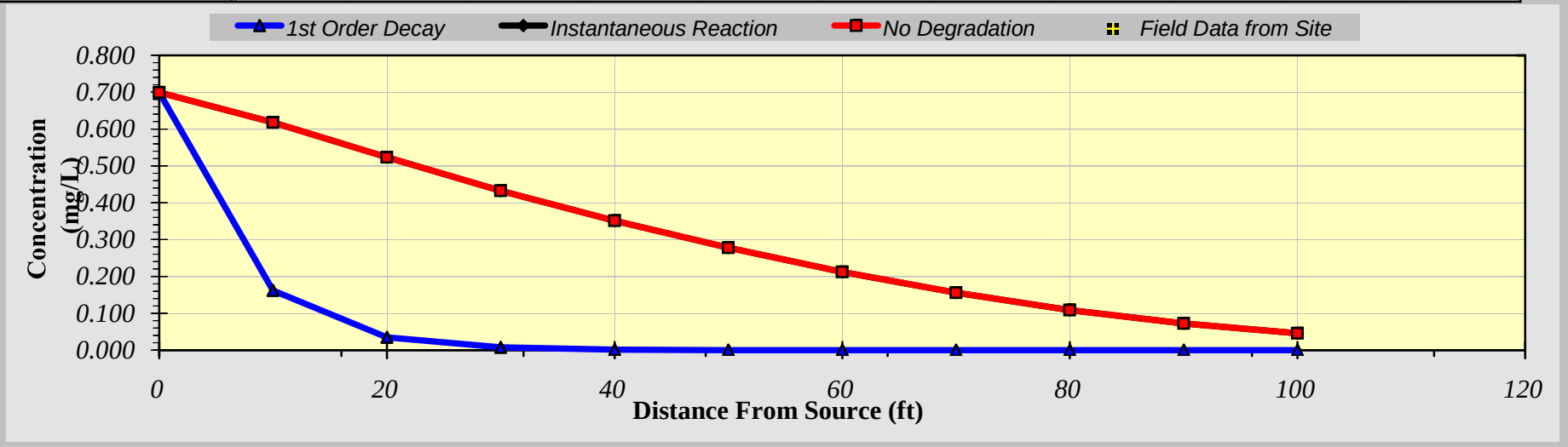
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

	Distance from Source (ft)										
TYPE OF MODEL	0	10	20	30	40	50	60	70	80	90	100
No Degradation	0.699	0.618	0.523	0.433	0.351	0.278	0.212	0.156	0.109	0.072	0.046
1st Order Decay	0.699	0.162	0.035	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.699	0.618	0.523	0.433	0.351	0.278	0.212	0.156	0.109	0.072	0.046
Field Data from Site											



Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Naphthalene
Run Name

Data Input Instructions:

115 or 0.02 — *1. Enter value directly....or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*

20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		or	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		or	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

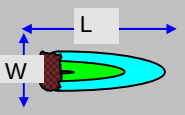
Retardation Factor*	*R*	28.3	*(-)*
or		or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	1191	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	1.6E-1	*(per yr)*
or		or	
Solute Half-Life	*t-half*	4.40	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	200	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

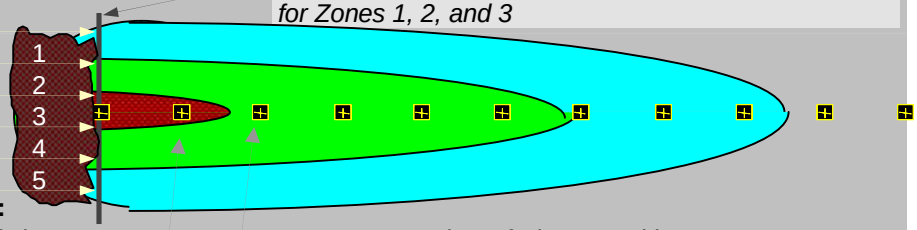
Width* (ft)	Conc. (mg/L)*
20	
30	
20	0.0619
30	0
20	0

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

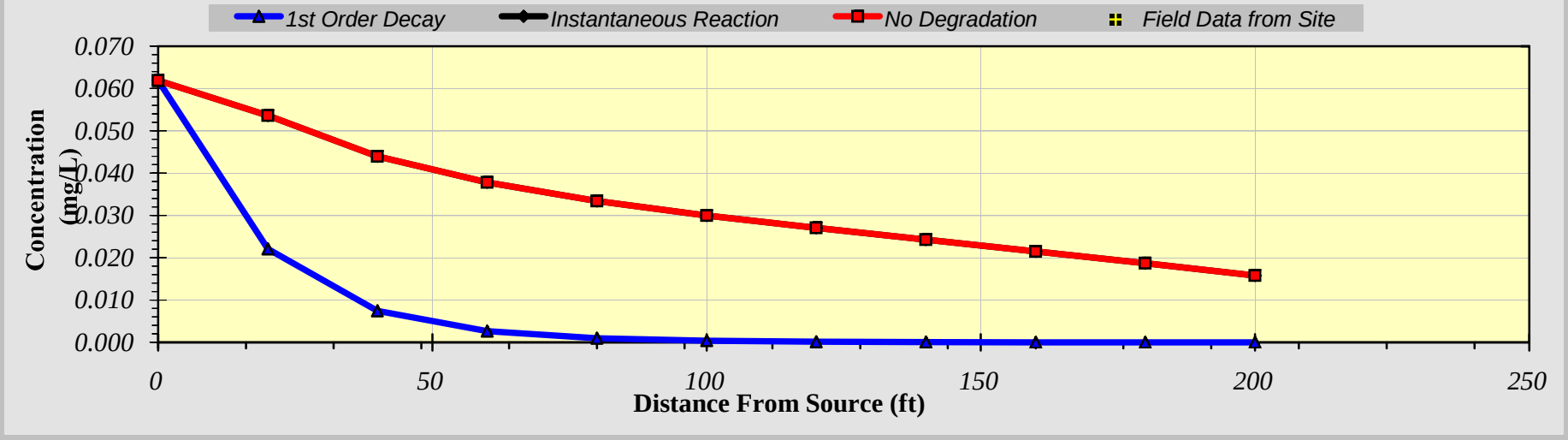
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

	Distance from Source (ft)										
TYPE OF MODEL	0	20	40	60	80	100	120	140	160	180	200
No Degradation	0.062	0.054	0.044	0.038	0.033	0.030	0.027	0.024	0.022	0.019	0.016
1st Order Decay	0.062	0.022	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.062	0.054	0.044	0.038	0.033	0.030	0.027	0.024	0.022	0.019	0.016
Field Data from Site											



Calculate Animation

Time: *100 Years*

Return to Input

Recalculate This Sheet

BIOSCREEN Sensitivity Run
Low Organic Carbon Partition Coefficient
(faster migration)

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Acenaphthene
Run Name

Data Input Instructions:

115 or 0.02 — *1. Enter value directly....or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*

20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		or	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		or	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

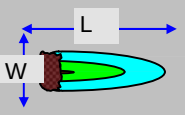
Retardation Factor*	*R*	90.3	*(-)*
or		or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	3890	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	2.2E+0	*(per yr)*
or		or	
Solute Half-Life	*t-half*	0.32	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

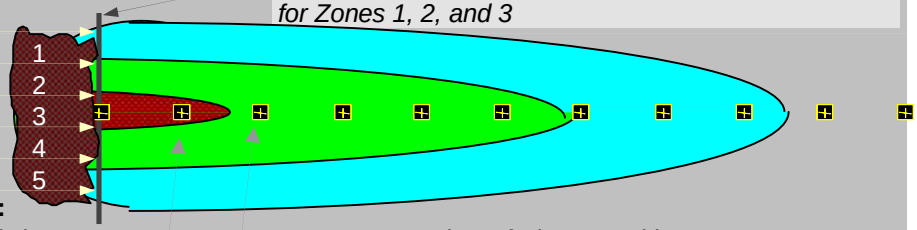
Width* (ft)	Conc. (mg/L)*
20	
30	
20	0.701
30	0
20	0

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

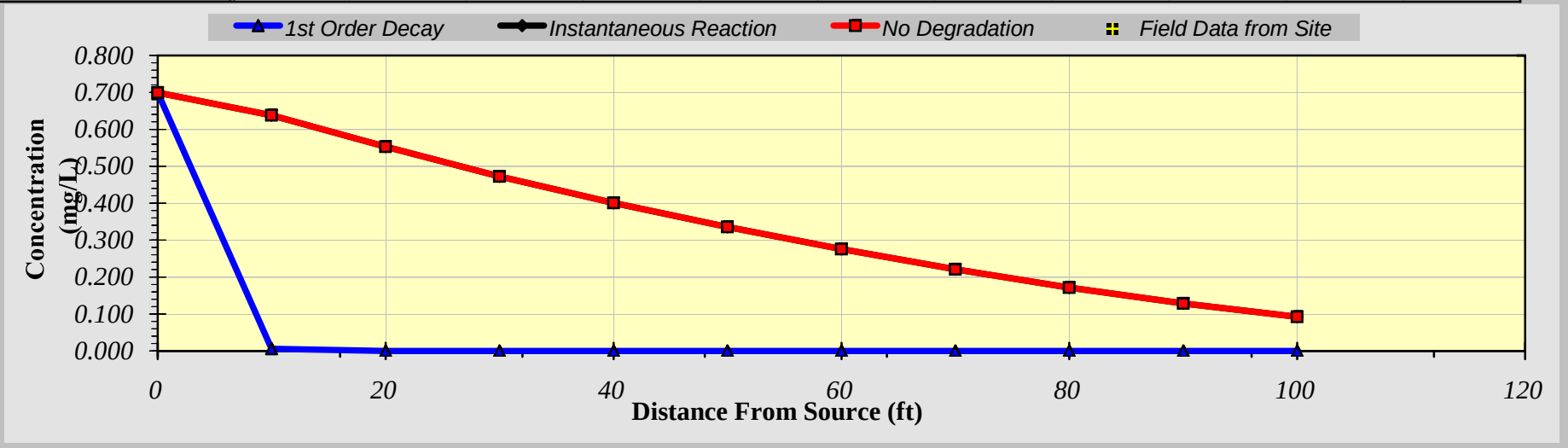
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	10	20	30	40	50	60	70	80	90	100
No Degradation	0.699	0.638	0.553	0.472	0.401	0.336	0.276	0.221	0.171	0.128	0.093
1st Order Decay	0.699	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.699	0.638	0.553	0.472	0.401	0.336	0.276	0.221	0.171	0.128	0.093
Field Data from Site											



Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Naphthalene
Run Name

Data Input Instructions:

115 *or* 0.02

1. *Enter value directly....or*
2. *Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*
20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		*or*	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		*or*	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

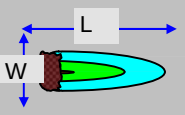
Retardation Factor*	*R*	21.0	*(-)*
or		*or*	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	870	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	1.6E+0	*(per yr)*
or		*or*	
Solute Half-Life	*t-half*	0.44	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

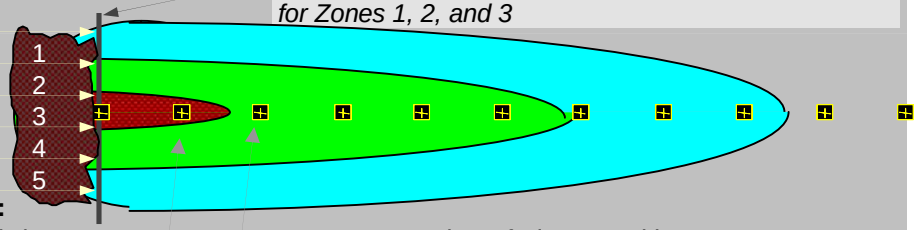
Width* (ft)	Conc. (mg/L)*
20	
30	
20	0.0619
30	0
20	0

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

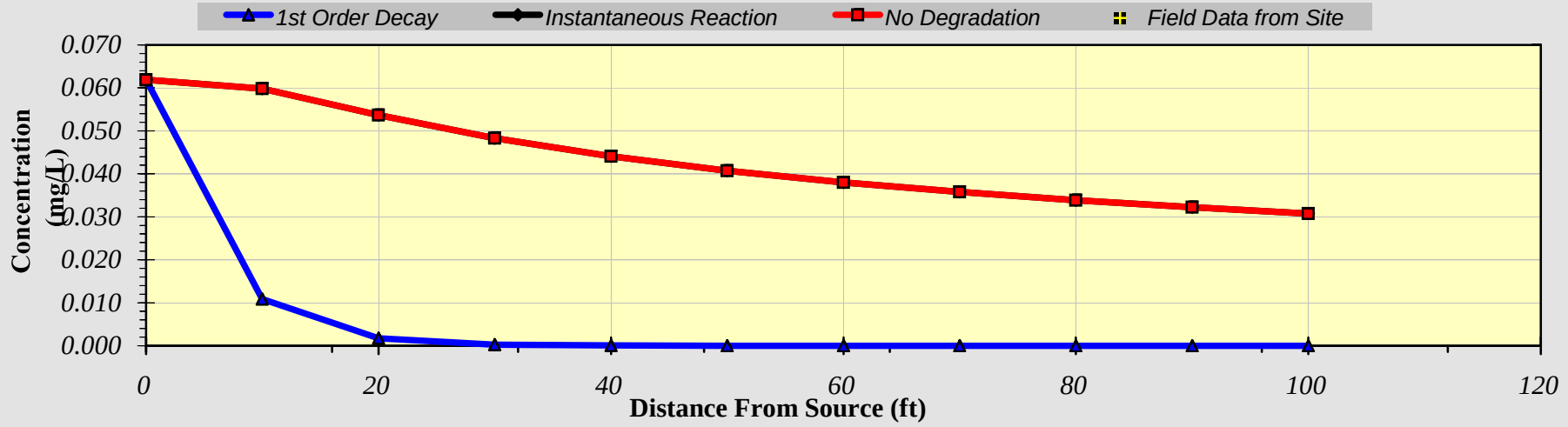
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

	Distance from Source (ft)										
TYPE OF MODEL	0	10	20	30	40	50	60	70	80	90	100
No Degradation	0.062	0.060	0.054	0.048	0.044	0.041	0.038	0.036	0.034	0.032	0.031
1st Order Decay	0.062	0.011	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.062	0.060	0.054	0.048	0.044	0.041	0.038	0.036	0.034	0.032	0.031
Field Data from Site											



Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Sensitivity Run
Elevated Concentration
(more potent source area)

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Acenaphthene
Run Name

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		or	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		or	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

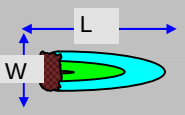
Retardation Factor*	*R*	113.4	*(-)*
or		or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	4898	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	2.2E+0	*(per yr)*
or		or	
Solute Half-Life	*t-half*	0.32	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



Data Input Instructions:

115
or
0.02

1. *Enter value directly....or*
2. *Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*

20 — *Value calculated by model. (Don't enter any data).*

6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

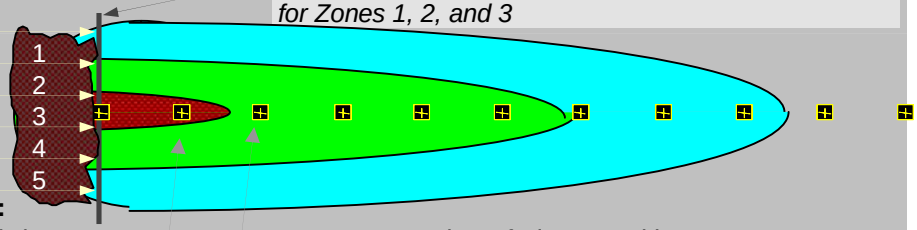
Width* (ft)	Conc. (mg/L)*
20	
30	
20	7.01
30	0
20	0

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	0	10	20	30	40	50	60	70	80	90	100
Concentration (mg/L)											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

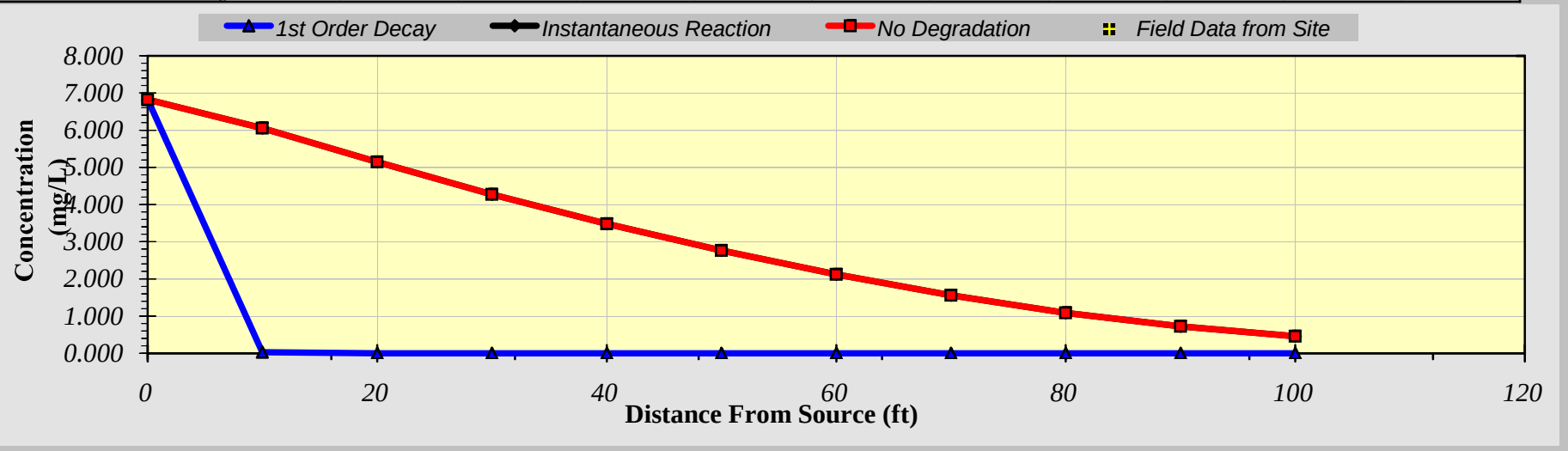
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	10	20	30	40	50	60	70	80	90	100
No Degradation	6.825	6.056	5.149	4.275	3.484	2.767	2.123	1.557	1.090	0.725	0.456
1st Order Decay	6.825	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	6.825	6.056	5.149	4.275	3.484	2.767	2.123	1.557	1.090	0.725	0.456
Field Data from Site											



Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Northwest Pipe
Naphthalene
Run Name

Data Input Instructions:

1. *Enter value directly....or*
2. *Calculate by filling in grey cells below. (To restore formulas, hit button below).*

115 or 0.02

Variable* — *Data used directly in model.*
20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	67.3	*(ft/yr)*
or		or	
Hydraulic Conductivity	*K*	1.0E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.0013	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	11.0	*(ft)*
Transverse Dispersivity*	*alpha y*	1.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		or	
Estimated Plume Length	*Lp*	200	*(ft)*

3. ADSORPTION

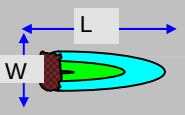
Retardation Factor*	*R*	28.3	*(-)*
or		or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	1191	*(L/kg)*
FractionOrganicCarbon	*foc*	2.7E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	1.6E+0	*(per yr)*
or		or	
Solute Half-Life	*t-half*	0.44	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*		*(mg/L)*
Delta Nitrate*	*NO3*		*(mg/L)*
Observed Ferrous Iron*	*Fe2+*		*(mg/L)*
Delta Sulfate*	*SO4*		*(mg/L)*
Observed Methane*	*CH4*		*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	100	*(ft)*
Simulation Time*	100	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Source Zones:

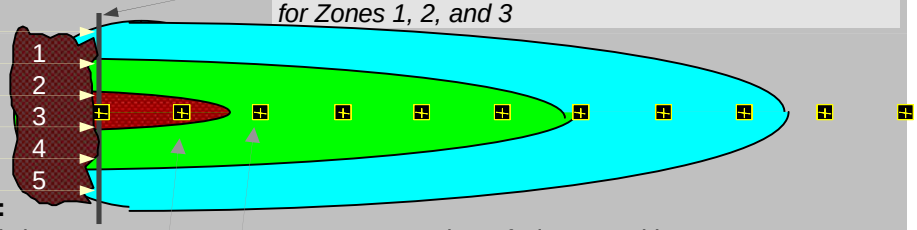
Width* (ft)	Conc. (mg/L)*
20	
30	
20	0.619
30	0
20	0

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	
Soluble Mass	2000	*(Kg)*

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

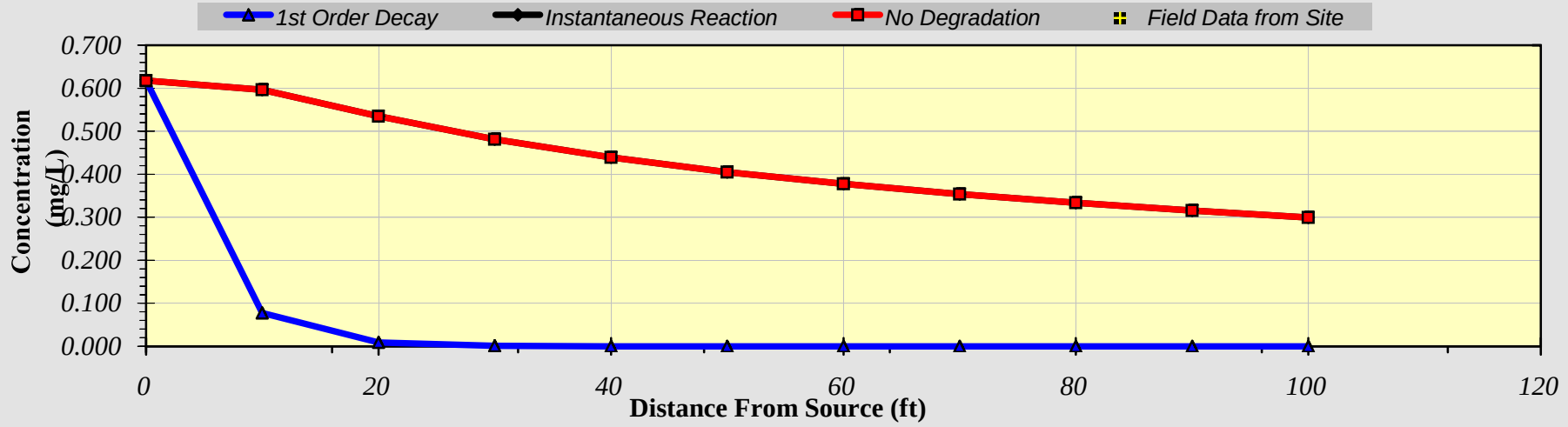
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	10	20	30	40	50	60	70	80	90	100
No Degradation	0.618	0.597	0.535	0.481	0.439	0.405	0.377	0.354	0.334	0.316	0.300
1st Order Decay	0.618	0.078	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.618	0.597	0.535	0.481	0.439	0.405	0.377	0.354	0.334	0.316	0.300
Field Data from Site											



Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet